THE IRON AGE

New York, June 26, 1930

ESTABLISHED 1855 VOL. 125, No. 26

Keystone of the Industrial Arch

By A. H. RODRICK*

THERE is a factor in industrial management the importance of which is not yet fully realized, although some attention has been given the subject in literature and practice. That factor is not an element, but a man. He is not the president of the corporation nor a member of the board of directors. His position is not spectacular; it is indicated by a small block far down on the organization chart. He has been referred to as the "top-sergeant of industry" and the "spark plug" in the industrial machine. He is the foreman.

Foremanship training is increasing in popularity, because modern industrial management emphasizes the recognition in recent years of the importance of the foreman's job. The schooling of foremen is a departure from the older order of management. Its advent is to be encouraged.

One writer predicts that training schools for foremen will constitute an outstanding feature of American industrial and economic life. A training course, however, which does not take into account the importance of the foreman's position will fall short of accomplishing its chief purpose, namely, to make the foreman an asset. Where such courses are in use or contemplated, the subject of the foreman's position should be given a conspicuous place in the curriculum.

*Industrial engineer, Washington.

THE foreman is the key to lower costs. He can stop wastes and promote salvage. He can do much to cut down the greatest single industrial waste—preventable accidents.

He should see that equipment is properly operated and maintained. What is even more important, he should bring out the latent ability of his men.

He must have forethought, tact, patience, impartiality. He must cooperate closely with other departments.

He exerts an important influence on stabilization of employment. The best way to keep a workman contented is to free him from the fear of unemployment.

What the Foreman Controls

If production is to be increased, if costs of manufacture are to be reduced, if planning schedules are to be met, the foreman is the one man who can bring about the desired results. If economies can be effected by salvage and waste elimination, the foreman is the one who is in a position to detect them. These are but two major possibilities inherent in the foreman.

If he carries on his work simply because he is paid to do it, he fails to realize the potentialities of his position. If he does realize them and acts accordingly he is an asset. The importance of the foreman's position is manifest in four distinct functions of management — production and lower costs, personnel, safety, and coordination and cooperation.

A manufacturer's most important problem is producing in the required quantity, at as low a cost as possible consistent with quality. This is not a new problem —it has been with him ever since the inception of industry for profit. But its

real importance is being felt more as industrial establishments grow in size and operating conditions change.

High Wages and Low Costs

For a long time economists as well as laymen contended that industries could not produce cheaply and maintain high wages. This would seem to be economically true, but, since the reverse has been proved, the economic theory has been lost in the actual fact of demonstration.

Any concerted effort, therefore, to effect a reduction in the cost of manufacture, either by increasing production or by eliminating waste of human motion or material, must have the full support, approval and enthusiasm of the foreman. He is the one who can further or retard any such attempt. He is the key man, and unless he is reckoned with in the carrying out of any such plan it is reasonably safe to predict in advance that complete success will not be obtained.

Foremen, as an aggregation of shop individuals, are jealous of their quasi-executive prerogatives. Frequently the management is required to cater somewhat to them, if wholehearted cooperation is to be secured in the prosecution of any general scheme of improvement or retrenchment which indirectly affects the particular work they supervise.

In addition to being the key man in any general scheme of improvement which, if put into effect, would benefit the factory as a whole, the foreman is also the key man in his own shop, in the matter of economical operation.

In business and industry it is expedient that economy be insisted upon, because the life of both depends upon profits. And if profits are absorbed by wastes there can be no "net" profit from which dividends are declared. Waste, notwithstanding present knowledge and improved equipment and machinery, still exists in industries. And indirect costs arising from uneconomical operation are making figures on the debit side of industrial ledgers. These costs should receive the same consideration as is given to labor and material in promoting economy. Maximum production at minimum cost is the chief object everywhere. The foreman is the one man who is in a position not only to detect waste when it exists, but to prevent it as a means of reducing costs.

Salvage as a Means of Reducing Waste

The foreman is also in a distinct position to effect further economies through the medium of salvage. Waste and salvage, while not dissimilar, are somewhat analogous in industries. Certain kinds of waste, though not unavoidable, have no potential uses, and therefore must be regarded as an actual loss. On the other hand, certain waste materials do have a potential value, because they can be used for other purposes, reclaimed or sold. The method by which this is accomplished is called salvage.

In the latter case it is the foreman's duty to see that nothing is discarded entirely which may be used in any part of the factory, either in its present or in a changed condition. Small pieces of material can be used on other jobs, oil can be reclaimed, and borings and turnings can be sold. When the foreman is looking for waste he is endeavoring to find something to salvage. And when he is looking for something to salvage he is preventing waste.

The question as to whether the foreman should know costs is still debatable. The writer is on the affirmative side, because he has found from experience that unless the foreman knows what it costs to operate his shop, he cannot be expected to know where or how to effect a saving, either in the cost of production or maintenance. A knowledge of shop expense impels a desire to economize.

He is no longer merely a boss of men when he has this knowledge, but a part of the management. He must understand his relation to the business as a whole and his responsibility for judiciously using the capital invested in his department. He is in the best position to observe and detect weakness in methods and to recommend constructive changes, because he is nearest to the work being done. His chief duty is getting work done with such speed, accuracy and economy as will result in a product of maximum quality at low cost.

Looking After Machine Tools and Other Equipment

The foreman is a factor in the care and operation of machine equipment. He must have knowledge of its cost, condition, suitability and normal capacity. He must know the rate of speed at which those under him can work, so that the flow of production may be kept regulated. He should see that the machinery is properly lubricated, kept in proper running order, properly operated, not overloaded and not abused.

He must cooperate with the repair department, to save expense and avoid interruption by having repairs made before breakdowns. He should also carefully supervise the use of machine tools and see that they, too, are not damaged when in use, and that they are given the proper care while in the tool room. The life of any machine or machine tool will depend on the care it receives.

Norris A. Brisco, in his book, "Economics of Business," says: "Men who know how to get maximum results out of machines are common, but men who know how to get cooperation and the greatest efficiency from the human element in industry, are rare."

As a key man, the foreman is a supervisor and director of shop personnel. He translates the policies of the company into understandable words to the workers. To many he not only represents the company, but is the employer. He is their boss, and in some cases the only boss they know. Not infrequently one hears a man say that he works for Mr. So-and-So, rather than for the John Doe Manufacturing Corporation.

(*Continued on page* 1940)

"Man on the Job" Needs Data on Costs More Than "Key Men"

BY THOMAS B. FRANK*

MODERN systems of shop management in most cases advocate taking executives, key men and foremen into the confidence of the company by giving them certain statements and schedules of figures pertaining to shop operations. Statements of productive hours, indirect labor, comparative earnings, departmental overhead rates and their composition and like information are the usual statements given to shop executives. Some companies give their department heads complete statements of departmental expense. This is all very good, as it tends to place more or less responsibility on the shoulders of those shop executives for the control of the expenses under their immediate supervision. But this does not seem to be sufficient to accomplish the desired results of cost reduction.

Most cost systems are designed, or should be, to accumulate cost data, direct and indirect, not only for labor and materials, but for all overhead expenses, from the historical standpoint and for the forecast or future standpoint as well. Both fixed overhead expenses (such as depreciation and interest) and controllable expense (such as supplies, power, maintenance) are tabulated upon cost records, presumably for the use of plant managers in an effort to attain control of those expenses, as well as for the furnishing of data for financial statements.

How About the Man on the Job?

These compilations of expense data will never be used to their maximum so long as such data reach only the key men or executives. It is true that those men should have that data and actually need them if they are to carry out their mission effectively. However, distribution and use of the data should not stop there. How about the worker, the man on the job, who actually uses the items comprising the bulk of controllable expenditures? He should have, and is entitled to, information intended to bring about the reduction of expenses.

It has been said that at present only about 3 per cent of all employees involved are informed of the results of studies to cut costs to a minimum. In other words, the men who use the supplies and perform the indirect labor and consume the items of controllable expense of plant production, and who are the only ones who have it in their power to reduce these items to a minimum, are the very ones who at present are given no information regarding expenses, or information how to accomplish cost reduction.

Better results in cost reduction would immediately become apparent if the workmen were informed and educated to become "expense conscious." Industry has devoted many hours to study and development of labor and material standards, but very little to the study of expense standards.

Elaborate incentive systems have been built up to encourage workers in meeting the labor standards, and in some cases for maintaining material standards. Why not a system of incentives to the worker for meeting or bettering expense standards and cost reduction by way of controllable expenses? It seems to be a very logical "next step" toward the effective control of costs.

Incentive Plan Offers Best Possibilities

It is entirely within the province of a real cost department to establish expense standards and work out an incentive plan to encourage workers to participate in cost reduction programs. The best results would be obtained in this manner. A cost department that cannot develop these standards from their present records is sadly deficient in one of its most valuable elements.

Expense information regarding controllable expenses, given to the men who are directly responsible, backed up by an incentive plan, certainly would prove valuable and much more effective than most methods in current use, which reach such a small percentage of the employees, and then not the ones who could do the most to cut expense.

Waste elimination campaigns, held periodically, and other campaigns directed at other cost or overhead factors have usually proved to be profit makers. Why not a plan that would assure a continual day-by-day, year-in and year-out drive at cost reduction through the elimination of excessive controllable expenses?

One dollar in each 400 dollars, in our national income, is spent for research, according to T. S. Harding, writing in *Atlantic Monthly*. But only ten cents of that dollar goes for fundamental research in pure science—for the acquisition of information on which civilization builds. The rest is used for "practical" investigations.

*Treasurer, Cincinnati Planer Co., Cincinnati.

Gas for Lead Hardening of Shovels

Lead Pot Fired with Gas Used in Regular Production, with Electrically Heated Pot to Take Peak Loads

BY C. GEORGE SEGELER*

ADVANTAGES of lead hardening for the heat treatment of shovels are almost self-evident. The high specific gravity of the lead permits the shovels to be floated in the bath. By the use of a heavy layer of powdered coke, the shovel blades can be maintained at the proper level without any other means of holding them down.

At the Baldwin Tool Works, Parkersburg, W. Va., the lead baths had been fired for a long time with natural gas, but the progressive policy of the company in investigating every possible improvement in process urged them to install an electrically heated lead pot, which was put in operation in April, 1929.†

Although the electrically heated pot is still available for use, the practice of the works is to use electricity only when the press of business goes beyond the capacity of the gas-heated pots. At such times the electricially heated pot is put into service, but this occurs rarely. A new gas pot has been installed, manufactured by Strong, Carlisle & Hammond, which is heavily insulated and of better design than the earlier gas pots which were in use there. It

*Industrial engineer, American Gas Association, New York.

†THE IRON AGE, Dec. 26, 1929, page 1725, "Economic Use of Electric Furnaces," by Wirt S. Scott.

Electrically Heated Pot in Foreground Is Working on the Small Round-Pointed Shovels Shown at Left. In left background an operator is putting clamps or brackets on larger shovels to prevent distortion in heating

is planned to control the temperature of this new gas pot manually, but automatic controls have been recommended and probably will be installed.

Comparison of Heating Values

Feeling that it would be of interest to the readers of THE IRON AGE to learn why gas is used rather than electricity for heating the lead baths, some fundamental economic data concerning natural gas have been included in this article.

Natural gas at 32½c. per thousand cubic feet, as served at Parkersburg, is equivalent to purchasing 30,700 B.t.u. for one cent. Of course, some of this heat will be lost in radiation from the pot, and some by the flue gas loss. Nevertheless, when compared with electricity at 1¼c. per kwhr., which is equivalent to buying 2740 B.t.u. for one cent, it is evident that comparison of energy equivalents must be favorable to natural gas.

The only difference in efficiency between electrically heated and gas-heated pots results from the fact that the gas pot has a flue loss. How much this amounts to depends, of course, on the operating temperature and the amount of over-ventilation. Under reasonable conditions, with a temperature of 1500 deg. Fahr., the flue loss might amount to 50 per cent, but even under those circumstances the cost of gas for fuel is obviously much less than the cost of electricity.

This flue loss need not be as high as has been indicated, because very efficient installations can be made by the use of a second pot, heated by the flue gases of the first pot. At the conclusion of this article a recommendation along these lines proposes an entirely new method of handling the shovels, which might be of interest, and which would certainly tend to be most efficient.

Equal Labor Cost for Same Product

Labor costs for operating lead hardening pots are equal, no matter what fuel is used, because the gas heated as well as the electrically heated pot has automatic temperature regulation, and requires no attention on the part of the operators. It was found, however, during the operation of the electrically heated pot, that the labor costs were a good deal lower.

Regrettably, that analysis depended upon the type of shovels being handled, and certain of the smaller, round-pointed shovels do not require a clamp on them to keep them from distorting when quenched. Therefore, handling the smaller shovels showed less labor. When the entire subject was reviewed, the fact was re-

Gas Furnace in Foreground and at Right, with Sockets of Scoops Protruding Above the Coke Covering Over the Lead

vealed that, for identical shovels, identical labor charges exist, no matter what fuel is used for heating the lead. It is not possible to make accurate and detailed cost comparisons of the operations at the Baldwin Tool Works, because the wide diversity of shovels handled by this company prevents it from maintaining records on the exact cost of operation of the furnaces, which adds only a small proportion to the cost of the finished product.

Character of Steel Used Has Bearing

Manufacturers of shovels employ a good many different steels, in accordance with the strength, toughness, resistance to wear, and the sales price which is to be established for the finished product. A brief survey of the significance of the various alloys may be useful in this comparison of gas and electricity. At the Baldwin Tool Works it was found that rapid deterioration of the electric heating elements occurs at high temperatures, so that electric heating is not used for the heat treatment of alloy steels requiring high temperatures.

Among the materials used here and elsewhere are molybdenum alloys, which are noted for their ability to retain complex carbides in solid solution upon cooling from the critical temperature, resulting in tough, resistant and strong steels (a). Chrome-nickel steels can be heat treated to give great hardness and strength, because a double carbide is formed by the introduction of chromium. This steel has the advantage of the effect of nickel on the ferrite matrix and the chromium on the carbide constituent, giving better physical properties than either element used by itself (b).

Manganese steels give excellent results when properly heated treated. The common "Hadfield" steel, with manganese 11 to 14 per cent, carbon 1.0 to 1.3 per cent, is frequently used, and gives a tough product, with excellent resistance to wear. High-carbon steels after suitable heat treatment make excellent shovels. These are somewhat less expensive, but are still far superior to the so-called "competitive" lines.

These different steels, of course, require different heat treatment, and that is very important to consider in making fuel comparisons. To be fair to every fuel, it is necessary to be sure that the comparisons are made with respect to one and the same article. Unless this is done, the conditions affecting lead consumption, labor, pot life and the other elements of production cost will not be identical, and erroneous conclusions might be drawn.

If reference is made to the pictures in the Dec. 26, 1929, article in THE IRON AGE, it will be seen that the shovels indicated in the general view of the gas-fired lead baths are very much larger than the round, pointed shovels shown in the quenching tank in front of the electric pot. Since the various sizes of shovels are immersed to different depths and treated differently, it is impossible to make a dollar-and-cent comparison in fairness to electricity.

Leaving aside all reference for the moment to the situation at the Baldwin Tools Works, an entirely new form of gas heating is beginning to develop, which bids fair to revolutionize the art of heating lead and salt baths. It is the immersion heating, using completely premixed air and gas mixtures of perfect proportions, so that complete combustion will be secured under all degrees of turn-down of the flames. This type of gas burning system permits high concentration of flames, so that the burning may take place in the interior of a submerged pipe under the surface of the lead bath. With this method of heating, the outside of the pot can be packed with insulation in the space formerly required for firebox and flue passages.

As a result of this construction the radiation loss is cut down, so that there is only the radiation from the top surface as a major item of heat loss from this source. Even the latter is well protected by the bed of powdered coke.

The flue loss is still present, but it, too, is cut down by the fact that there is no excess air required for combustion, and that there is no air movement during the off periods of the burner. The pilot burner is adjusted to burn enough gas to keep the lead molten over night and week-ends. But, since it also operates on a perfect air-and-gas mixture, there will be no excess air during the time when the main burners are off. This is quite different from the operation of an externally fired pot where atmospheric pilot burners are used.

High-Heat and Low-Heat Pots in Tandem

This look into the future introduces another possibility, namely, to lead the flue products from a high-heat lead pot to a low-heat lead pot, and to change the heat-treating process. A comparatively cheap material which is both strong and tough, and capable of taking a remarkably hard edge, is the type of steel known as Vanadium-G, which averages 0.60 per cent carbon, 0.98 chromium, 0.30 to 0.40 manganese, and 0.35 per cent vanadium. This material is a good deal less expensive than some of the alloys now in use, and might make a very satisfactory shovel.

Research done by R. Guthrie, Chicago, indicates that this steel could be heat treated in two lead hardening furnaces running in series, as has just been indicated. The first pot would be kept slightly above the upper critical temperature Ac_2, and the other a little bit over the Ar_2 point. The latter, being at a lower temperature, would be ideally suited to heating by the flue products from an immersion heater in the high-heat pot. Possibly some additional heat might be needed in the low-heat pot, but the combination would be at levels of efficiency impossible to attain in any other way.

The treatment of the type Vanadium-G steel is to harden in two steps: First, to heat as quickly as possible above the Ac_2, and then to quench by plunging into the Ar_2 pot. The length of time the steel stays in the latter pot is immaterial. From that pot quenching into cold water can be done as desired, or quenching into oil, if a slightly lower hardness is wanted.

Although this two-step hardening process is somewhat unusual, it seems to result in much higher physical properties. Ductility is higher, and that should give a reduction in warpage, cracking and so forth; and a tough structure is obtained which will lengthen the life of the shovel.

(a) "Experiments with Rare Metals," Transactions American Electrochemical Society, May, 1923.
(b) "Nickel and Nickel Steels," by Thomas Wickenden.

Need of Standardized Cost Figures Stressed Before Foundrymen

ON ONE job, 12 large foundries that use cost systems estimated the costs anywhere from 1.2c. to 3.2c. per lb. The use of cost figures is the greatest problem for foundries today.

First step to bring about better conditions in competitive districts is for foundrymen to know each other better.

High-test iron castings have made inroads on forgings. Some lost business can be recovered by more attention to alloy castings.

Today foundries are melting at higher temperatures, thus increasing the refractory requirements and the importance of solving refractory problems.

MEANS of enlarging the market for castings, standardization of a system of computing costs so that foundries will figure these on the same basis, and other problems of interest to the foundry industry were discussed at the third sectional conference of the Ohio Foundries Association, held at the Congress Lake Club near Canton, June 18. There was an attendance of about 75 members, including representatives of the gray iron, steel, malleable and nonferrous branches of the industry. Following a luncheon, the remainder of the afternoon was devoted to talks and informal discussions. Robert Hopkins, Alliance Brass & Bronze Co., Alliance, presided as general chairman.

Use of Cost Figures Greatest Problem

HOW to use cost figures is the greatest problem before the gray iron industry to day, declared A. C. Denison, Fulton Foundry & Machine Co., Cleveland, in a talk on "Evils in Using Cost Figures" that aroused a great deal of interest. He cited various cases to show that there is a wide variation in estimates of costs of jobs, caused by using different well recognized methods of computing costs. On one job 12 large foundries having cost systems figured their costs all the way from 1.2c. to 3.2c. per lb.

To prove his contention that desired results are not being obtained with the present lack of uniformity in methods of pro-rating costs, the speaker took as examples two castings made in heavy shops, one weighing 300 lb. and the other a counterweight weighing 3000 lb.

Different Values from Five Methods

There are five ways, he said, of figuring costs, all actually used and sponsored by good accountants. Assuming that five foundries have the same costs, he presented an analysis to show the cost of making these castings based on the different methods of pro-rating cleaning room and other costs. These figures were based on actual costs for making the two castings in two Cleveland foundries. The cost of producing the smaller casting ranged from 13.26c. to 14.80c. per lb., a difference of 1.54c. per lb., depending on the method of pro-rating costs. The production cost of the larger casting ranged from 2.42c. to 2.65c. per lb. when computed by the same five methods.

What is likely to result from this lack of uniformity in methods of pro-rating costs? the speaker asked. Answering his own question, he said that a shrewd buyer will shop around and buy one class of work from a foundry that figures its costs one way and other types of castings from other foundries that use other methods of computing costs. The estimated cost of one type of casting may be lower when figured by one method and the cost of another casting may be lower when figured by one of the other methods. Purchasing agents, he said, can "beat foundries to death" unless the method of handling cost systems is standardized.

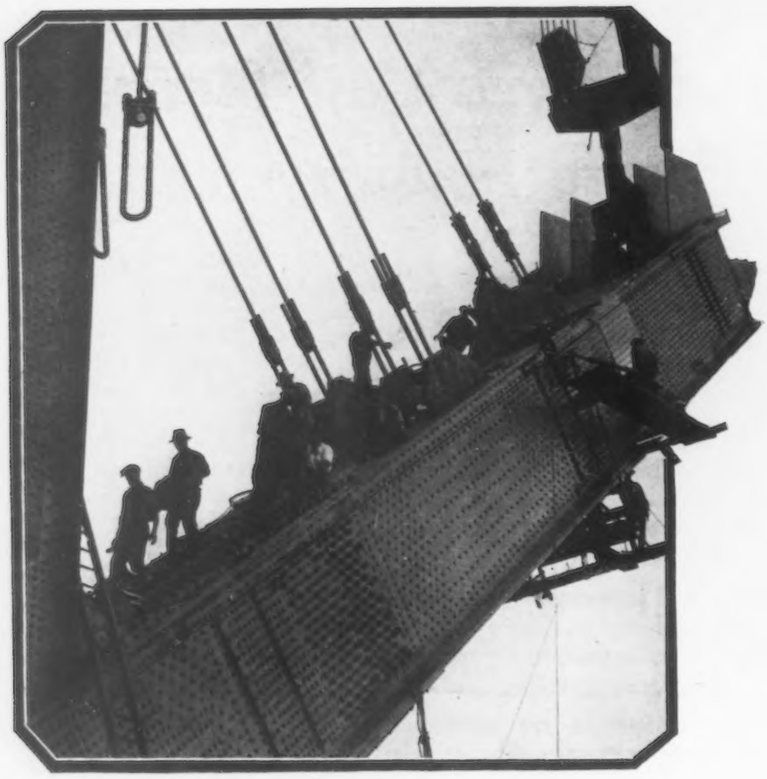
Advocates Closer Contacts Among Foundries

CLOSER contacts among foundries in the same field, so that foundrymen will know their competitors, was urged by Robert Hoierman, secretary of the association, who said that he had visited 230 Ohio foundries during the last two months. Outstanding causes of the present unsatisfactory situation in the foundry industry, in his opinion, are lack of business, price cutting to build volume and lack of backbone. The first step for bringing about better conditions, he said, is for foundrymen to know each other better and have confidence in each other.

Competition from Other Products

More important than the competition in the foundry industry itself is the competition that comes from makers of other products, in the opinion of Mr. Hopkins. Foundrymen, he declared, are doing little to replace casting business that is being diverted to other materials and he hoped the association could add

(*Concluded on page* 1941)



Charging Machine for Sixty-Foot Plates

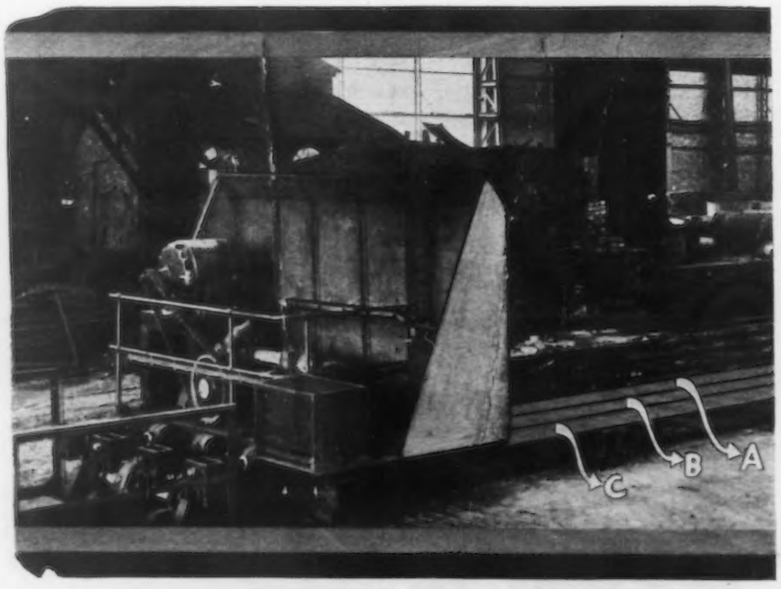
EQUIPMENT of unusual size is required to fabricate and erect the members of the large bridges now being constructed in various parts of the world. We are used to thinking of America as the home of the "biggest" structures, but far-off Australia shares with us the distinction of building the largest arch bridge. The total cost of this project is estimated at $18,300,000. Steel was manufactured in England by Dorman, Long & Co., but fabrication was done near the site in a large structural shop at the water's edge.

For the last five years this 1650-ft. arch, together with approaches reaching a mile and a half in either direction, has been under construction across the main entrance to Sydney harbor. Some 50,000 gross tons of steel are required. The arch itself contains no less than 37,000 tons, even though the principal stress-carrying members of the latter are of a normalized silicon-manganese steel.

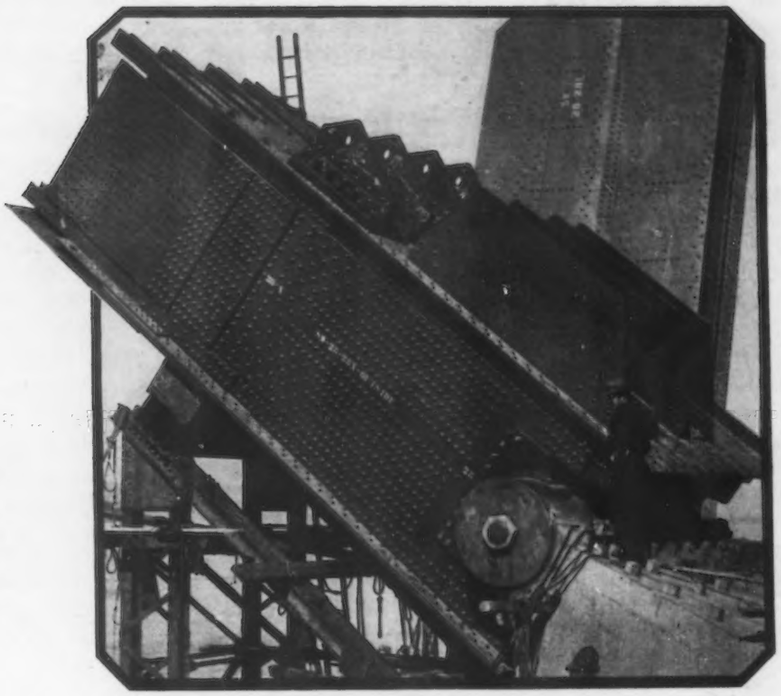
Despite the fact that the traveler which is erecting the bridge can lift 122 gross tons, the end panel of the lower chord shown in the illustrations had to be erected in six parts, divided once lengthwise and into thirds crosswise. Its overall dimensions are 99 in. deep and 11 ft. broad; its web members are plates 2⅛ in. thick; its flanges are 12 x 12 x 1¼ in. angles, and the biggest rivets are 1 13/32 in. in diameter and grip 12 in.

Average analysis and physical properties of the high-strength steel used for these main members are

Carbon	0.35 per cent
Silicon	0.20 per cent
Manganese	0.90 per cent
Ultimate strength	85,000 lb. per sq. in.
Yield point	48,000 lb. per sq. in.
Elongation in 8 in.	22 per cent
Reduction of area	38 per cent



Charging Machine Capable of Handling 15-Ton Hot

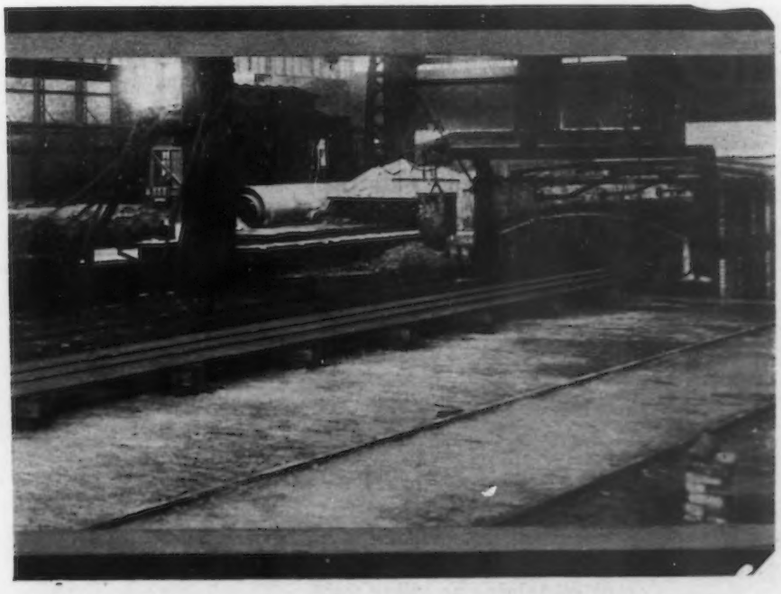


A SPECIAL-PURPOSE machine for handling plates of unusual dimensions into and out of a normalizing furnace is justified by the magnitude and importance of the work it has to do

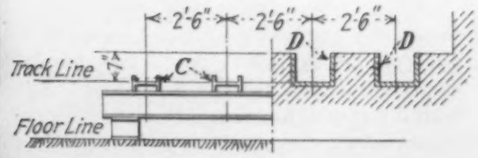
To meet the specifications plates for main webs are normalized. Special furnace equipment for handling such pieces, 9 ft. by 60 ft. maximum dimensions and weighing up to 15 tons, was built by Gibbons Brothers, Ltd., Dudley, England. This Gibbons-Van Marle furnace charger is of the nature of a mechanical peel, and is patterned after machinery of size suitable for furnaces 25 ft. long and taking a load of 2 to 3 tons. These smaller machines (patented in America) are built on transfer tables, and can serve a battery of furnaces; the charger shown in the illustration is stationary, since one furnace is sufficient to handle the work for the Sydney bridge.

The view shows the charging machine wholly withdrawn, having deposited its load inside the furnace (the door of which is closed). After the plate has uniformly reached normalizing temperature and soaked for the specified time, the charger enters the furnace, picks up the plate and removes it—the whole operation from "door up" to "door down" occupying about 90 sec. The hot plate then cools in the air, resting undisturbed on the charging machine until it is stiff enough to move, when an overhead crane replaces it with a cold plate ready for heat treatment.

It can be seen that the bed of the charging machine consists of four fingers, something over 60 ft. end to end. A side elevation would show three long bars *A*, *B* and *C*; the lower one *C* is a stationary track, the up-

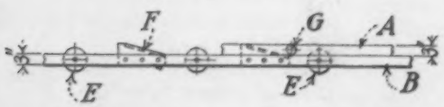


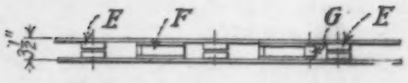
Plate, 60 Ft. Long, 9 Ft. Wide, at Normalizing Furnace



Half Section Through Charger Track — Half Section Through Furnace Floor

Half Section Through Charger Track and Furnace Floor





Finger Bar Construction

per two may move as a unit when going into or coming out of the furnace; the upper one *A* also moves up and down when picking up or depositing its load on the furnace hearth.

Half cross-sections of the charger track and furnace bottom are shown in line cut. The rails *C* are I-beams, turned on edge, with upstanding flanges tracking the rollers attached to fingers *B* on the charging machine. These rails *C* butt into the front end of the furnace, and match as to elevation the bottom of U-shaped channels of heat-resisting castings laid into the furnace floor, as shown. These castings therefore form a prolongation of the track *C* within the furnace, and are wide and deep enough to pass fingers *A* and *B* in their close nested position.

Once the fingers of the charging machine are within the furnace, bar *A* is lifted from bar *B*, thus picking up the plate resting on the furnace floor, clearing the latter about 1½ in., and in this position is trundled back out of the furnace. In-and-out motions are given by a pair of endless chains geared to the 25-hp. motor in the pit at the extreme left of the photograph. Over-run is prevented by spring bumpers at each end of the track.

An interesting device is used to raise bars *A* from bars *B*.

Each of these four fingers is constructed of a pair of bars, properly spaced by filler blocks and countersunk-head bolts. At close spacing the lower bars *B* have rollers *E* attached, large enough in diameter to hold bar *B* clear of the flange of I-beam *C*, and also extend up between the side bars *A* and keep them definitely in place. These are the main rollers which carry the load in and out of the furnace.

To raise *A* from *B* it is only necessary to pull *A* longitudinally along *B*. An electric motor is mounted on a platform across the outer end of the movable part of the charging machine, to effect this motion by reduction gear acting upon a rack and pinion. As *A* is pulled along relative to *B*, small rollers *G* attached to the former roll up the inclined tops of blocks *F* fixed to the latter, which of course lifts *A* and any load it may contain.

The steel shield shown at the end of the charging machine is to protect the motor and gearing of this lifting mechanism from the heat when the fingers are thrust into the furnace.

To charge a plate into a hot furnace the cycle is as follows:—Bar *A* is pulled into its "up" position, and the plate is properly placed on the charger. The entire assembly then rolls into the furnace; the fingers entering the slots in the furnace bottom and the plate clearing the latter by about 1½ in. When all the plate is inside the hot zone, the charging machine stops its forward motion, finger *A* is moved forward along *B*, lowering its load upon the furnace bottom and sliding further until it clears freely. The charging machine then retreats and the door is closed.

Unloading operations are performed in the reverse order.

Influence of Washing Coal on Coke Properties and Yields

A STUDY of the influence of washing coal on coke properties and on gas and by-product yields has been made by the United States Bureau of Mines. In considering the use of washed coal, the gas or coke plant operator is concerned with two classes of effects: those due to the removal of free mineral constituents such as slate, shale, bone and pyrite and those due to the surface moisture left in the coal from the washery.

All of the first class are desirable, as they improve the quality of the carbonization products. The second class of effects, those due to moisture, are complex, partly desirable, but mostly undesirable, especially with a material increase of moisture in the coal. The favorable effects of eliminating free mineral impurities may be summarized as follows:

1. Improvement of coke quality.
   a. Reduction of ash and sulphur.
   b. Less clinker trouble.
   c. Fewer cross fractures in coke, resulting in greater resistance to breakage on handling, less small coke and breeze.
   d. Greater uniformity in chemical composition and physical properties of coke.
2. Less sulphur in gas.
3. Greater yield of gas and by-products per ton of dry coal charged.

The adverse effects of moisture are:

1. Reduction of oven capacity, due to lower charging density of moist coal, and longer time required to complete coking at a given temperature.
2. Higher fuel consumption per ton of coal carbonized.
3. Non-uniform coke, due to wet spots in charge.
4. Excessive moisture, 12 to 15 per cent, causes large-celled, weak coke.
5. Dripping wet coal may cause spalling of the brick oven lining.

On the credit side of the ledger, moisture increases the ammonia yield and reduces carbon deposits on the oven walls. Its effect on gas, light oil and tar is open to question. Other variables, such as temperature, coking time and amount of moisture, complicate the situation; in the absence of further data, no definite conclusions can be made with respect to these products. On the whole, it seems certain that the moisture should be kept low (not to exceed 4 to 5 per cent) for the most economical results.

By-product coke engineers have observed that, although coals containing an excessive amount of splint coal may be good gas coals, they tend to produce a weak coke. Sections of coke from such coals indicate that the splinty particles do not thoroughly fuse and become incorporated with the rest of the coal substance. Work on the coke and gas-making properties of coal, now in progress at the Pittsburgh experiment station of the Bureau of Mines, indicates that weak coke is produced from splinty coals at high carbonizing temperatures (corresponding with coke and gas works practice). When made at lower temperatures, the coke is not inferior to that from coals of similar rank containing no splint coal.

How Ford Forms and Polishes Rustless Steel Radiator Shells

RUSTLESS steel is 20 per cent more ductile than ordinary steel. It is also much stiffer and stronger.

More pressure is necessary on the draw rings for rustless steel than ordinary steel.

A chrome-nickel alloy cast iron, heat treated, is used for the draw dies and rings.

Best results on draw dies follow if drawing surfaces are finished with a stone instead of an emery polishing wheel.

Seventeen operations are required to form a Ford radiator shell.

Shells are polished at the Ford plant in groups of five and not made of polished metal.

USE of rustless steel in exposed metal parts of the Ford car necessitated the installation of new machinery in the Ford plants and the development of new methods in drawing operations.

More Ductile Than Ordinary Steel

Rustless steel, an alloy of chromium, nickel and iron, is about 20 per cent more ductile than ordinary steel but the ductility decreases faster during the drawing stages. Therefore the various operations must be continuous. Furthermore, rustless steel is much stronger and stiffer than ordinary steel and, while the dies are of the same design as those used in the forming of ordinary steel, greater allowance must be made for spring back.

In the Ford car, rustless steel is used for the radiator shell, cowl strip, head lamps, tail lamp, hub caps, gasoline tank cap, radiator cap and in the cowl lamps of those models having cowl lights. The metal is purchased by the Ford Motor Co. from several producers.

How the drawing operations are accomplished without annealing is illustrated in the manufacture of radiator shells in the company's Rouge plant at Dearborn. The metal comes in sheets of 24 gage, 78¾ in. long and 30¼ in. wide. From each sheet two oval-shaped pieces are stamped, each of which becomes a radiator shell.

The drawing solution, which is applied before the first drawing operation, is composed of a definite quantity of lithaphon, cup grease, sulphur, talcum powder and paraffin oil, thoroughly mixed.

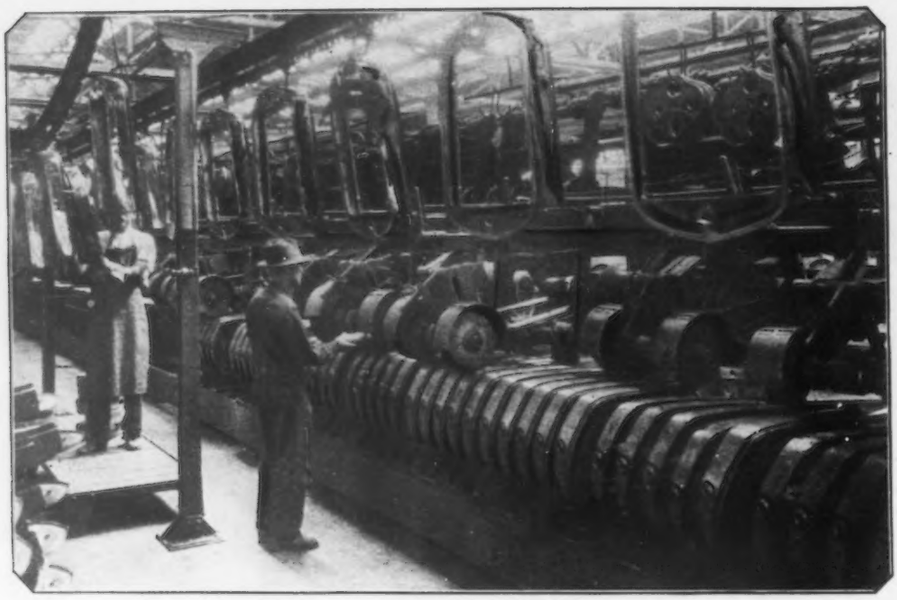
The oval piece of metal, after passing through this solution, is drawn into the shape of a pan 4½ in. deep in an ordinary toggle press of about 250 tons, using the same drawing speed as that required for ordinary steel. There is an air attachment adjusted to 35 lb. per sq. in. on the knockout pad, which also locks the blank to the drawing punch to prevent the metal skidding while being drawn into the die. To prevent scratches and score marks, the space between the walls of the die and the punch is the thickness of the rustless steel plus 0.007 in.

In drawing rustless steel more pressure is required on the draw rings than is the case with ordinary steel. In order to lessen this pressure, it is necessary to have double draw beads on the die. The edge thus left on the "pan," after the drawing operation, is subsequently trimmed off.

Drawing the Ford Rustless Steel Radiator Shell in the Rouge Plant of the Ford Motor Co.

Special Heat-Treated Cast Iron for Dies

The draw die and rings are made of special cast iron of close grain, as follows: Carbon, 3.25; manganese, 0.45; chrome, 0.70; nickel, 2.00; silicon, 1.25 per cent. This special cast iron, after being cast and machined to shape, is treated as follows: Heat to 1550 deg. Fahr. and cool in air; then heat to 900 deg. Fahr. and again cool in air. Brinell hardness should be 288 to 311.



BUFFING the Sides of the Rustless Steel Radiator Shells. The shells are locked on frames in groups of five and travel through the battery of buffing machines on a slowly moving conveyor

* * *

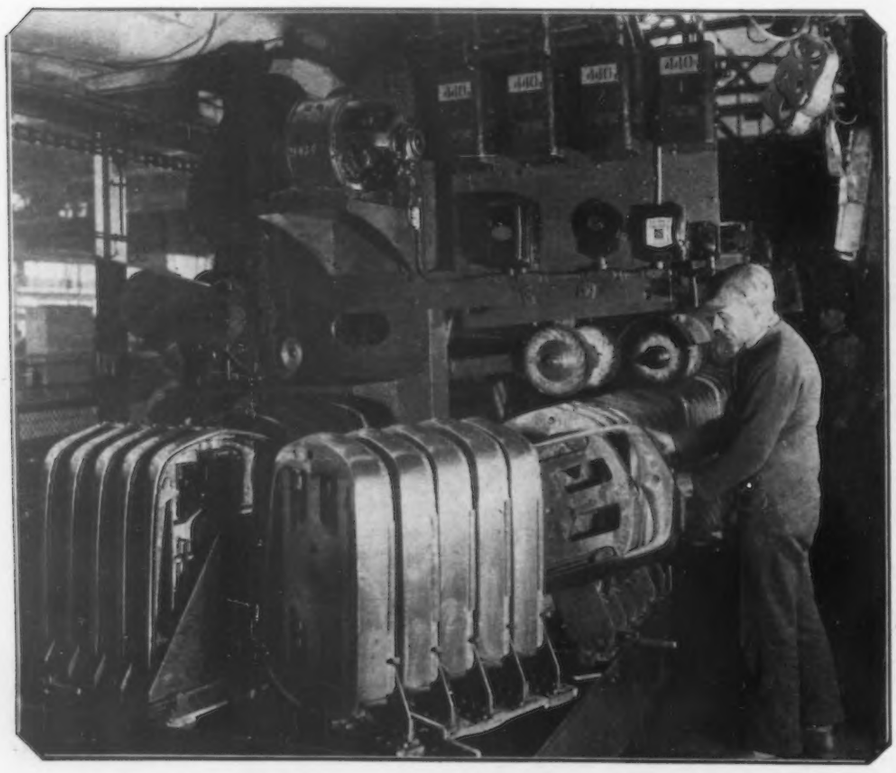
Polishing Rustless Steel Radiator Shells for the Ford Car (Below)

To get the best results on draw dies, all drawing surfaces are finished with a stone instead of an emery polishing wheel. The space between the die and draw ring is very smooth and constant, as small indentations on the surface will pick up and cause scratches.

The draw punch is made of chrome non-shrink air-hardening steel sections, seated in a cast iron punch shoe. These punch sections are hardened as follows: They are heated to 1350 deg. Fahr., then transferred to a furnace of 1900 deg., allowed to soak to 1900 deg., and then hung on a wire and allowed to cool in air, after which they are heat treated to 980 deg. Fahr. an hour for each inch of thickness of section.

There are 17 operations in the forming of the radiator shell. After the oval piece of rustless steel has been drawn into the shape of a pan 4½ in. deep, the edge is trimmed off and the pan goes into another press where the decorative pattern is pressed into it. The next operation indents the edge in which the hood tape is placed, the next cuts out the end of the pan that forms the bottom of the radiator shell and the next cuts out the pan's bottom, thus making the opening in the front of the shell into which the radiator is fitted.

In subsequent operations a hole is cut in the top for the radiator inflow pipe, another is cut in the front for the crank and a small strip is spot welded in the top of the shell for reinforcement. After the final forming operation, the shell is placed on an overhead conveyor, going to the polishers.



The shells, arranged in groups on polishing machines, are given a rough buff with a 180-mesh abrasive, followed by a 200-mesh emery and then a buff of 244-mesh emery, which brings out the luster. The shell then gets its final polishing.

Surplus pieces from the bottom and end of the pan are utilized for making smaller parts. There is enough metal from each radiator shell to make one crank hole cover, one lamp case, one tail light body, one tail light door, two cowl lamp bodies and other smaller parts.

Open-Hearth Furnace Control Discussed at Symposium in Buffalo

ABOUT a dozen men participated last week in an open discussion on the general subject of open-hearth furnace control, at one of the sessions in Buffalo of the Association of Iron and Steel Electrical Engineers. This was started by three papers, one by R. W. Simpson, American Heat Economy Bureau, Pittsburgh, one by Mr. Bradley, Leeds & Northrup Co., Philadelphia, and one by Joseph F. Shadgen, Smoot Engineering Co., New York. Following those speakers were discussions by representatives of various control and recording apparatus manufacturers and by a number of operating men.

For best results with furnace control, Mr. Simpson said, deeper checkers are needed than in usual open-hearth practice. A fan is then used to supply a sufficient quantity of cold air. It happens that the least amount of natural draft is available at the time when draft is most needed; that is, at the start of a heat on cold stock.

Great skill is needed on the part of the operator when he has to maintain manual control of a furnace. With machine control, however, this task is made easy. The port construction of the furnace must be adjusted to meet the average conditions, regardless of the variation in velocity of the gases, coming from a difference in the character of gases used.

By the use of combustion control, we have eliminated one of the variables which make furnaces act differently. This provides greater uniformity of operation, better quality of product, an increase in the output and less repairs.

Looking to Temperature as Control Basis

Temperature is one of the most important factors in the operation of a furnace, according to Mr. Bradley. All of the chemical reactions are directly influenced by the temperature. So also is the slag control and the matter of getting the heat up to a fluidity at which it can be poured. A high degree of preheat speeds up all the operations.

The difficulty usually experienced is not in reaching the necessary high temperature, but in the control of the high temperature and avoiding burning the roof, etc. Usually the preheat is regulated on a time basis, with reversals of the furnace on about a 15-min. schedule, whereas some years ago 20 min. was more usual. As a result, there frequently is an unbalance of the two ends, with bad conditions. Flame temperature is essentially a function of the speed of combustion.

The most efficient reversal method, he said, is to control by means of the variation in temperature in the system itself. This may be done by putting two thermocouples in similar positions, one at each end of the furnace. It must be remembered, however, that the temperature differential method does not avoid overheating. A difference of 150 deg. works the same, whether at 1800 deg. or at 2400 deg. Fahr.

Great Advantages Obtainable from Proper Control

Combustion control is the dynamic end of the furnace, where the furnace design itself is the static end, said Mr. Shadgen. The dynamic end is the most important part of the furnace, despite claims of the furnace makers to the contrary. Its main control advantages are an increase in production, a decrease in fuel, a longer life and a better metallurgical operation.

Control apparatus as now installed pays for itself in about a year. It is, however, still in the experimental or transitional state. We want more installations, so that we can study the question more widely and learn more about what they will do.

Fundamentals along this line include the fact that (1) Complete machine control is essential. (2) Engineering adaptation is necessary; that is, the machines must be adapted to the furnaces. (3) Edu-

cation of the personnel will overcome the initial suspicion with which machine control is regarded; first the service man finds acceptance, then the equipment, then the operation. (4) Supplementing the man by machines requires a regulator; this is a dynamic job, designed to keep moving elements in balance. (5) The machine control system must be in line with placing responsibility where it belongs.

We must work on the flow of gases, rather than on mere temperatures. Temperature is a result of the conditions in the furnace and the work must be applied to the cause. By this means, we have been able to reduce the fuel consumption by from 7 to 15 per cent, with an increase in production.

Suggests Abandoning Reversal of Flow of Air and Fuel

A complete control system divides itself into control of combustion and control of reversals, according to Mr. Higgins of the Shallcross Control Systems Corporation, Milwaukee. We control combustion—that is, the ratio of air to fuel—by measuring the excess oxygen in the waste gases. We may also adjust the ratio of air to fuel by balancing the differentials in their respective flows.

Furnace atmosphere is a most important factor. With excessive draft there will be air infiltration through the doors. With good control, we can better regulate the amount of air drawn in.

At this point the speaker expressed the view that the time might, perhaps, be near when we can consider and design the open-hearth furnace as a one-way furnace. A favorable heat balance is hard to get now. The temperature requirements of the open-hearth will not permit the use of the ordinary air and fuel reheater. But the speaker believes that the future will give us an improvement over the present two-way method of open-hearth practice.

Carbon monoxide recorders in the stack are not a very satisfactory measure of combustion for open-hearth furnaces, one man reported, because of the variable emission of CO_2 from the bath. Nevertheless, they do indicate in a measure the efficiency of combustion. For example, within limits, a high reading registers good combustion, and vice versa.

Control Keeps Furnaces Running Evenly

Air supplied to the open-hearth furnace, in the opinion of Mr. Greenburg, of the Bailey Meter Co., Cleveland, is to care not only for the needs of the fuel, but also for the combustible coming off from the bath. The meters either tell the operators what adjustments to make, or, with automatic control, themselves actuate the control devices.

An open-hearth man reported having five furnaces operating with automatic reversal based on temperature control. He said that the best running furnaces were those running most evenly. Occasionally all furnaces will get into a condition of unbalance, and the operator will complain of a cold end. The control helps the combustion by providing a constant supply of preheated air.

Mr. Shadgen told of studies made on the element of conversion costs per ton between pig iron and steel. These have been widely variant, but a general average of around $3 was cited. Of this amount fuel represents about $1, direct labor $1, and materials (for maintenance, etc.), $1. Thus, there is only about $1 a ton in the fuel costs, on which to work with any control system.

In closing the discussion, F. E. Leahy, combustion engineer, Youngstown Sheet & Tube Co., Youngstown, who presided at this session, remarked that control systems are designed essentially as an aid to the first helper, and not as a substitute for him.

▲ ▲ ▲

IN the Field Museum, Chicago, there have been constructed four life-size figures of typical native iron workers of the Tinguian tribe of the Philippines, one of them a woman. The forge was obtained in the village of Balbalasang, which means the town of many maidens. It is one of the communities noted for fine ax heads and spear points.

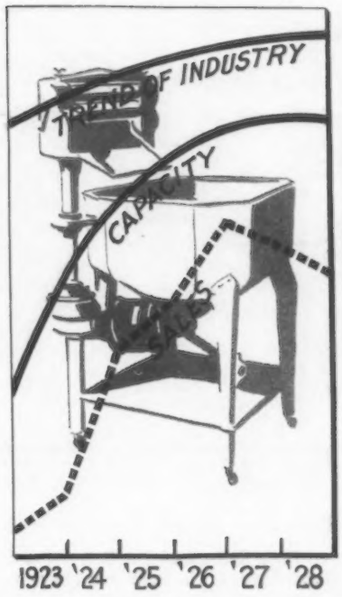
▼ ▼ ▼

Closing of Markets Results in Excess Capacity in Consumer Goods

By W. W. HAY

WHEN competitive advantages represented by various forms and modifications of monopoly have, to a large extent, become equalized in an industry producing consumer goods, it is highly probable that the market may be closing or is already limited. Modern methods of mass production and mass distribution have resulted in the rapid saturation of new markets and in the early closing of parts of such markets, if not the whole. Rapidly expanding markets attract more and more manufacturers and the potential production of all tends to equalize the advantages of low manufacturing costs. The cumulative effect of rapid increases of plant facilities devoted to the mass satisfaction of markets is over-capacity for the available market.

It is natural for industry to expand its potential ability to produce more goods, and the progressive manufacturer must provide excess plant capacity in order to keep ahead of the actual demand for his goods and preclude the possibility of shortages. When a sufficient number of manufacturers in the same industry expand in this way, any recession of demand finds each with excess capacity unless production continues. This is what happened in the radio receiving set industry last winter and it resulted in the withdrawal of many companies because of financial difficulties.



A Closing Market for Washing Machines

SALES of a Single Washing Machine Maker Increased Much More Rapidly Than Production for the Entire Industry ("Trend of Industry") Until 1927, When Competition From Other Manufacturers Forced Retrenchment. Capacity of the individual manufacturer was in keeping with its sales, but a rate of increase so much sharper than that for the industry as a whole could not be maintained

Generally speaking, markets remain "open" as long as consumption continues to expand, but when the rate of increase diminishes to a small percentage, or when the additions to the volume of goods "in use" become approximately equal from year to year, the market may be said to be "closed." This observation holds true for entire industries and is particularly true in the case of individual corporations, two samples of which are presented—one a manufacturer of washing machines, the other a motor car builder. In both illustrations, the industry first became limited and afterward the market for the particular manufacturer was satisfied. As a consequence, neither has been able to make an advance in recent years.

Expand After Their Markets Close

In spite of the closing of their markets, each of these highly progressive manufacturers continued to expand their plant facilities for some time after consumption of their own article ceased to gain. A rational increase of plant facilities would have been at the same rate as the growth of demand measured by the actual consumption of their markets. Thus, the potential production facilities of the motor car manufacturer might have been expanded, after 1926, at the same rate as registration was expanding. Additional capacity would then have been secured, not by new buildings and more tools, but by improving methods, thereby securing further reduction in manufacturing costs. On the contrary, there has been an actual decline in plant efficiency because this management, having excess capacity, has not yet felt any necessity to improve methods in order to secure needed production increases.

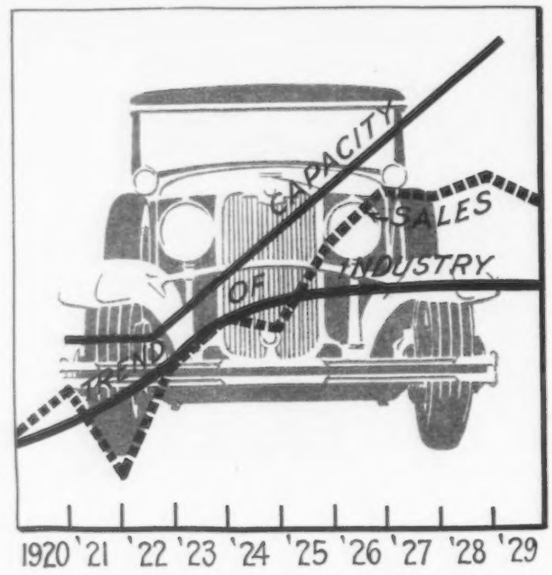
No manufacturer not protected by patents or processes can surpass all competitors for an extended period. Low manufacturing costs may secure a temporary advantage, or skill in merchandising may enable a manufacturer to forge ahead of all competitors for a while. But in the passing of time, competitors will appropriate the ideas and adopt successful methods until these temporary advantages are equalized. In the case of the washing machine manufacturer, the management either planned to secure a much larger share of the market than it was entitled to, or else grossly overestimated the actual consumption of its market. In any event, there has been a steady decline of nearly 10 per cent annually in the dollar volume of sales per dollar value of net plant investment. The excess capacity of this manufacturer is now a real burden on the business.

After all, the measure of any manufacturing success is the ability of the business to continue to earn

regular and increasing profits for the real owners,—i.e., the holders of the common stock. Neither of the corporations discussed has made any increases in earnings since 1926, nor is it likely to recover any ground this year.

Pressure of Surplus Capacity Intensifies Competition

The pressure of excess capacity on closed markets, coming usually at times of lessened activity, leads to the intense competition so frequently prevailing. Those manufacturers who have survived usually are financially strong and are able to attempt to secure production by more intensive selling, by lower prices or by giving greater value for the same price, and by other means. But most of the increase secured by one manufacturer necessarily must be at the expense of his competitors' business and this leads to the constant shifts within the industry that are characteristic of limited markets. The most notable example is, of course, the withdrawal and recuperation of Ford in the domestic passenger car market, a market that discloses all of the characteristics of a limited market. In order to secure the advantage now his, Ford withdrew entirely from his market. There were then several changes of position among other makers, and the return of Ford resulted in still other shifts among competitors.



The Experience of an Automobile Maker

THE Dotted Line Represents the Sales of a Single Automobile Manufacturer. The solid line above represents the capacity of that producer. It will be noted that plant expansion continued for some time after sales stopped increasing. The lower solid line (on a different scale), representing total automobile production, shows that the trend for the entire industry flattened out several years before the manufacturer in question underwent a similar experience

Booms Overstimulate Plant Expansion

The cyclical expansion and contraction of most markets for consumer goods causes great differences between the peaks and valleys of production. A common and almost universal fault of management is to increase plant facilities and plan distribution on the false trend of these temporary movements. This is illustrated by the fact that the construction of industrial floor space has for years increased and decreased in area coincident with the rise and fall of business. Naturally, since plant expansion takes place in boom times, it happens that the following depression leaves many manufacturers with excess capacity completed at or near the peak of the cycle.

Excess productive capacity in a limited market exerts a pressure upon the entire industry, irrespective of the wishes of individual manufacturers. In the struggle to hold a fair share of the market, manufacturers use the surplus earnings of good years to improve plant and equipment in lean years and thus reduce the costs of production. The efficiency of new and better methods of manufacturing leads to greater capacity when there is already too much capacity. Improved plant facilities and greater efficiency may secure to one manufacturer a temporary advantage over his competitors by enabling him to lower his price to bring additional capacity into use and thereby secure the economies possible from large scale production. Competitors must then adopt similar tactics, and all are compelled to redouble efforts to hold their share of the market; and in their efforts to survive, they in turn make improvements to plants and add more capacity to the industry already suffering from excess capacity. It is the presence of excess capacity that is a burden on the industry; and prices and profits are restricted not so much by overproduction as by the efforts to use excess capacity.

H-Beams to Carry Power Wires

ELECTRIFICATION of 70 miles of the Delaware, Lackawanna & Western Railroad has involved a number of unusual problems in design and construction of steel structures. *Railway Age* in a recent issue tells of the supporting members carrying the overhead power wires.

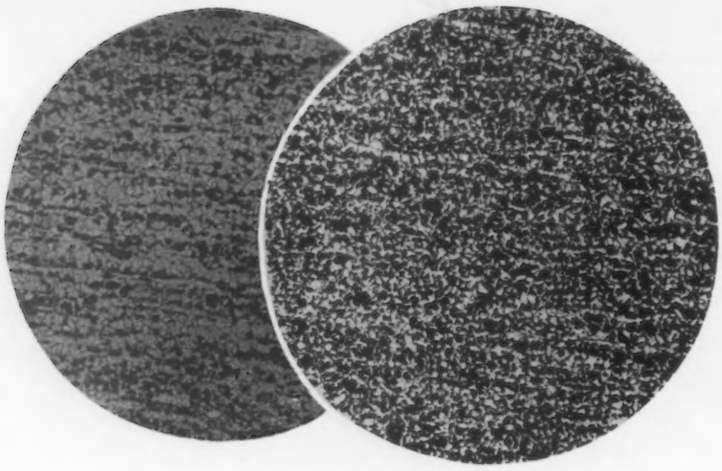
Columns for structures spanning three tracks are 12-in. 79-lb. Carnegie H-sections where the track is straight, and 14-in. 86-lb. sections on curves. Horizontal members, column to column, are beams, also; 10-in. 49½-lb. sections are used with straight track, and 12 x 14-in. 69-lb. sections on curves. When spanning only two tracks all these members are smaller.

Main messenger wires are of composite construction, consisting of seven strands of bronze surrounded by 13 of copper, the whole having a diameter of 0.821 in. Guaranteed minimum breaking strength is 31,000 lb. per sq. in. Two grooved, bronze contact wires are used, each of 12,000-lb. breaking strength and with about five-ninths the conductivity of copper.

These elements of the power-carrying system are attached to the horizontal "bridges" by means of a top plate and a botton L-section secured to the hozizontal member by two bolts. Supports on the alternate form of horizontals—trusses—consist of light H-beams. These span the truss panel from which the catenary is suspended.

Noise Deadening and Air Conditioning in New Plant Office Building

MUCH attention has been given in recent years to the working out of ideal conditions for factory employees in many plants, but the office and executive staffs have frequently been left in noisy, dirty, poorly ventilated surroundings which cut down the efficiency of their work. The Columbus Bolt Works Co., Columbus, Ohio, has changed all this in its new office building at 291 North Water Street, Columbus. This structure, with 62½ ft. frontage and a depth of 187½ ft., has one story and basement, with a garage in the rear. A quiet office in a noisy neighborhood was attained by heavy fireproof construction and by double windows set 4 in. apart, the air chamber between acting as a deadener of sound. A system of air conditioning was installed by the Carrier Engineering Corporation, which provides washed and filtered air. With heat and ventilation automatically controlled, windows and doors are kept closed at all times and outside dirt is virtually eliminated. Executive offices have floor coverings of rich carpet, and windows are hung with heavy draperies, which serve to enrich the appearance and to help secure desired quiet. An illustration shows the office of J. Robinson Poste, president and general manager.



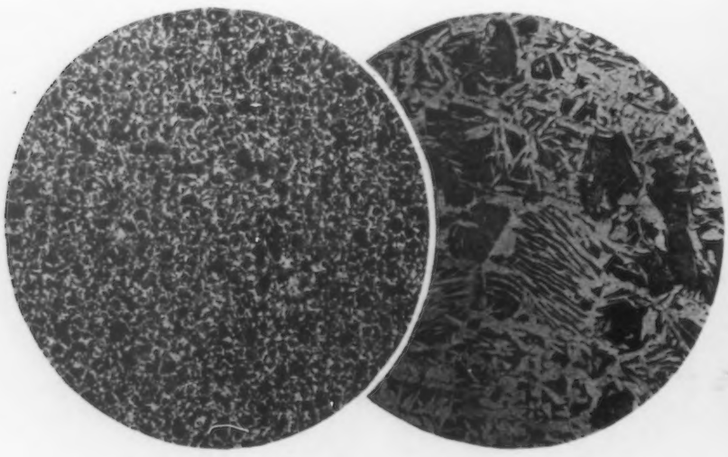
Cleaner Better Claimed for a

FOR many years clean steel has been the goal of American and other steel makers. It is acknowledged that in mass production of open-hearth and of Bessemer steel, in particular, attainment of this aim is not easy. To make clean steel of the highest type requires time and great care and is difficult where large tonnages in as quick a time as is reasonably possible are involved.

Better quality in mass production is universally desirable; it is one measure of the forward march of the steel industry. Carbon steels have been improved in physical properties by the introduction of alloys in their multitudinous combinations. Progress in this has been phenomenally rapid. Physical properties, both static and dynamic, now possible should more than satisfy the demands of modern engineering. Notwithstanding this progress, there is a real demand for cleaner steel and for uniformity and homogeneity of structure. There is some demand in specifications for proper structure and minimum permissible inclusions.

Quantity and Distribution of Inclusions Regulated

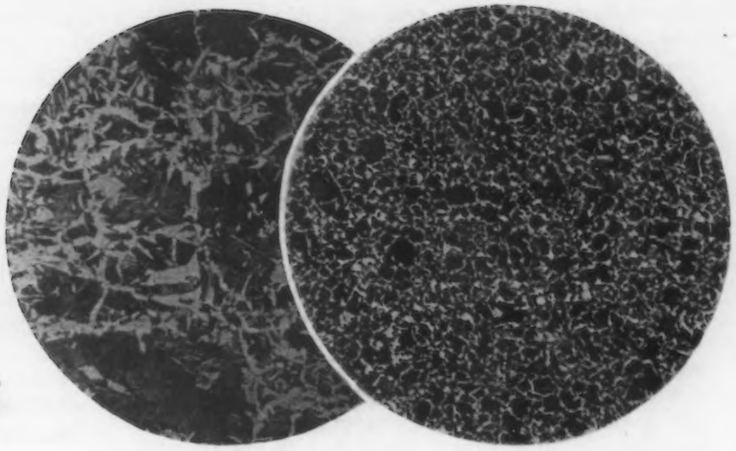
After several years of intensive research the Refined Steel Products Co. of Pittsburgh has developed a refining process and product which, when added to molten steel, is said to reduce, eliminate or control the solid non-metallic inclusions and other deleterious constituents so as to change or modify the structural characteristics, thereby giving to carbon steel values comparable with those of some of the alloy steels and



PHOTOMICROGRAPHS (100 X) of 1-in. Round Bars, Normalized. The left-hand micro in each group is from bars selected at random in the open market. The right-hand micro is from a heat of steel of the same composition treated with "Densite." Steel at top of page is 0.35 per cent carbon; steel at bottom is 0.38 per cent carbon.

Etched Surface (Right) of the Top Center of a Bloom of 0.48 per cent Carbon Steel, Cut Down from the Top. Steel is regular basic open-hearth product

Steel of Quality Special Process



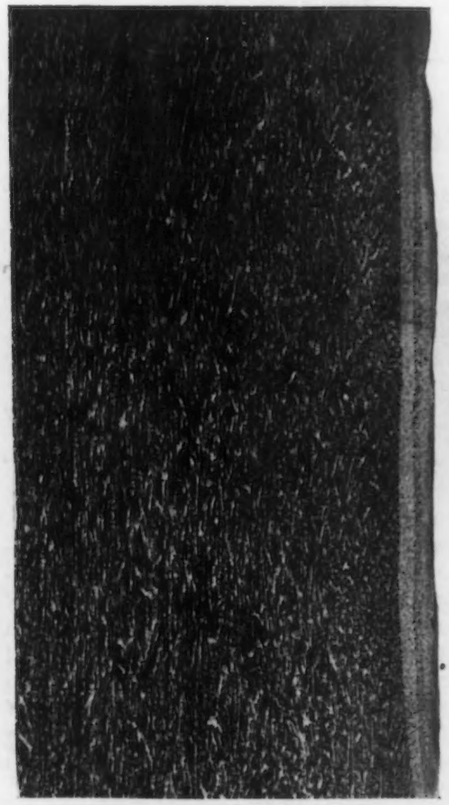
further augmenting the present alloy steel values, or making possible values higher than those obtainable in the carbon steels by the use of lower percentages of alloys.

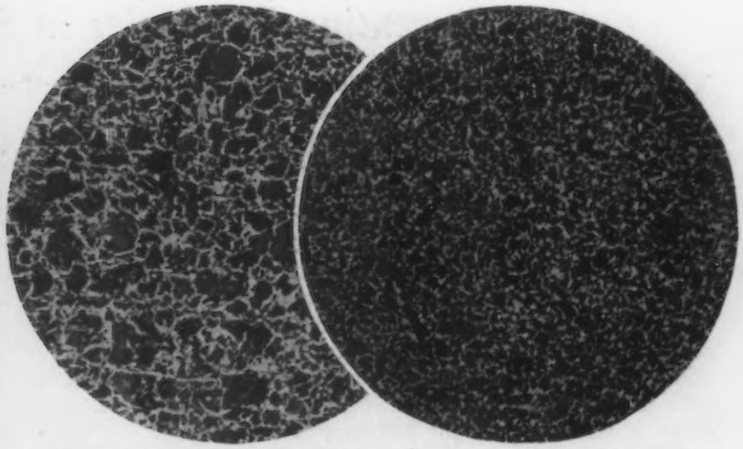
Some failures in service of both carbon and alloy steels are directly traceable either to lack of structural homogeneity or presence of solid non-metallic inclusions which, when subjected to continued stress, fail sometimes at stress values far below the standard values for both dynamic and static stresses. Due credit must be given to the value of alloy additions to steel, each having its own particular function in producing structural characteristics either singly or in alloy combinations. Few, if any, combining alloys have any appreciable influence on the elimination of the solid non-metallic inclusions. In fact, in the use of some alloys, the end product of the reaction may have a bad effect similar to the one which the use of the alloy had hoped to eliminate or correct.

"Densite" Is the Refining Material

The refining material developed by the Pittsburgh company is known under the trade name of Densite and consists essentially of an intimate, finely-divided mixture of carbon and other chemicals. This material is packed in metallic containers and is added to the ladle during the tapping operation in quantities approximating about 4 lb. per ton of metal treated.

Because of the complexity of the reaction it is not definitely known just what the effect of the exothermic reaction is that takes place when this mixture is added to the molten steel in the ladle. There is reason to





PHOTOMICROGRAPHS (100 X) of 1-in. Round Bars, Normalized. The left-hand micro in each group is from bars selected at random in the open market. The right-hand micro is from a heat of steel of the same composition but treated with "Densite." Steel at top of page is 0.41 per cent carbon; steel at bottom is 0.48 per cent carbon.

Etched Surface (Left) of the Top Center of a Bloom of 0.50 per cent Carbon Steel, Cut Down from the Top. This heat was treated with "Densite"

believe, however, that the production of a rapid evolution and expansion of carbon monoxide acts as a propellant or a carrier to further disseminate the refining material throughout the molten metal. At the temperature and pressure of the reaction the finely divided carbon and the carbon monoxide together have a definite reducing action upon the occluded oxides and serve an important and necessary function in the purification of the steel.

Effect of the Material on Molten Steel

The effect of the addition of Densite is described as follows: When the initial force of the expanding gas has been dissipated and the refining material disseminated throughout the bath, the carbon monoxide gas in rising to the surface creates a decided but not harmful ebullition of the metal and in its upward movement augments the elimination of a major portion of the inclusions.

Elimination of inclusions is claimed as largely due to this great reactivity, that is, the tendency of some of the chemical constituents of the mixture to combine with the sonims in forming products of lower fusibility. As a result, the products of reaction are much more fluid and of decreased surface tension, resulting in a more ready agglomeration and coalescence of the slag particles to and above the critical size.

During the research work, photomicrographs were made of a large number of heats of Densite-refined steel. To show the presence of inclusions it was necessary in the majority of cases to go to higher magnifications. These dispersed relatively submicroscopic inclusions, as revealed at 3500 magnifications, are regular in their orientation and are, no doubt, contributory to the modified grain structure.

The sponsors of this process, from tests made on a commercial scale, make a number of claims, including:

1. Etch and fracture tests of Densite-treated carbon and alloy steels all show that it affects the primary crystallization of the metal. Sections of large forgings show a uniformity of structure seldom obtained. Test bars taken from the center of locomotive axles, forged from the top bloom of the ingot, more than satisfy the tensile test requirements of the locomotive builder.

2. Densite-refined steel, due to its modified structure, will withstand drastic quenching operations. Some 1-in. round bars from a 0.48 per cent carbon heat, were quenched at 1800 deg. Fahr. and 2000 deg. Fahr., respectively, in cold running water and drawn at 1000 deg. Fahr., having the following properties:

Quenched at Deg. Fahr.	Ultimate Strength, Lb. per Sq. In.	Yield Point, Lb. per Sq. In.	Elong. in 2 In.	Red. of Area	Fracture
1800	137,000	115,140	18.0	50.1	Full cup
2000	136,300	119,250	14.5	38.4	½ cup

A more drastic test of the resistance to cracking under severe quenching was made on 1-in. round bars of S.A.E. 1095 steel. These bars were heated for one hour at temperatures indicated below and quenched in cold running water, drawn at 1000 deg. Fahr. with the following physical results:

Quenched at Deg. Fahr.	Ultimate, Strength, Lb. per Sq. In.	Yield Point, Lb. per Sq. In.	Elong. in 2 In.	Red. of Area
1600	181,250	138,000	11.0	24.0
1700	173,150	138,200	9.0	14.8
1800	163,000	137,400	7.0	10.4
1900	163,400	136,500	6.0	9.3

3. Fractures of Densite-refined steels indicate the steel to have inherent properties of greater interest and value than indicated by the values of the standard tensile test.

Preventing Pin Holes in Steel Castings

WITH the increasing use of steel castings for industrial purposes, more exacting demands as regards specifications are being made, according to the Bureau of Standards. Higher strength and ductility are required. Foundrymen are often called on to produce castings having a minimum strength of 60,000 lb. per sq. in., a stretch of 24 per cent in 2 in. with a reduction in area of 35 per cent.

These properties can usually be obtained if castings are poured in dry or core sand molds. Green sand or moist sand molding, however, is usually desired for most work. With the customary moist sand molds, it is frequently found that "pin holes" occur at places where the moisture is trapped. If aluminum is added to the steel shortly before pouring (about 1 lb. per ton), the porosity trouble is usually overcome, but the resulting castings will have lower ductility than if aluminum had not been added.

In some preliminary work at the Bureau of Standards, a study was made of the strength, ductility and soundness of steel castings, involving many foundry variables. If the composition is maintained between 0.10 and 0.17 per cent carbon, the manganese between 0.60 and 0.70 per cent, and the silicon between 0.30 and 0.40 per cent, the addition of the customary aluminum shortly before pouring will give steel castings which are usually within the specified limits of ductility after the heat-treating operation. When the carbon is too low there is a danger of not meeting the tensile strength requirement.

Variables having the greatest effect on ductility were found to be the metals used for "degasification" or "deoxidation." None of these "deoxidizers," such as ferroboron, silicon, beryllium, was superior to aluminum in producing soundness.

Some experiments were made with mold preparations in the form of surface treatments with aluminum and powdered "deoxidizers" for counteracting the mold moisture, but these treatments do not seem to be promising. The mold conditions, such as sand and moisture, are probably the important variables responsible for "pin-holes." A sufficient amount of "deoxidizer," however, should be in the steel at the time of pouring to deoxidize the steel from any gases evolved from the moisture of the mold.

Study Requirements of Anti-Friction Bearings for Mills and Motors

INVESTIGATIONS of the special committee on bearings of the Association of Iron and Steel Electrical Engineers, which were begun in 1927, have been divided into four parts:

Application of Anti-Friction Bearings to Mill-Type Motors (reported in *Iron and Steel Engineer*, June, 1929).

Application of Anti-Friction Bearings to General Purpose Motors.

Application of Anti-Friction Bearings to Electric Overhead Traveling Cranes.

Application of Anti-Friction Bearings to Mill Roll Necks.

Data sheets in the report of the committee, presented at the Buffalo meeting of the association, cover 31 pages of tabular matter relating to the general purpose motors and six pages for traveling cranes.

General Purpose Motors

In general, the motor manufacturers have carried out the practice of utilizing the S.A.E. 300 series bearing where ball bearings are applied. These bearings are interchangeable in mounting dimensions with the various standard ball bearing makes.

In some instances, roller bearings are applied which are interchangeable in mounting dimensions with the 300 series ball bearing. In some other instances, roller bearings are applied which are not interchangeable in mounting with the S.A.E. ball bearing sizes.

Overhead Traveling Cranes

Bearing sizes in the crane tabulation are made sufficiently large to suit wheel axles of ordinary steel forging stock, 0.30 to 0.40 carbon, with ultimate tensile strength of 74,000 lb. per square inch. The diameter of the axle at the bearing fit is computed to allow a factor of safety of not less than 5, including bending stresses.

In many cases, it is possible to apply a smaller size bearing based on catalog rating of the bearing to suit a given wheel load. But this application necessitates the introduction of special alloy steel axles to obtain sufficient strength in wheel pin. This practice is to be discouraged from a standpoint of maintenance in steel mills, where it is desirable to furnish renewal axles through the plants' local repair shops, which in many cases are not in position to furnish conveniently the special alloy steels.

Bearings for Mill Roll Necks

On the subject of roll-neck bearings the association has collected considerable data. However, this problem has by no means been solved and there still remain to be done considerable research, tests and study of the experiences of those applications now in use.

One of the first problems to be settled before any real headway is made is: How and by what method shall rolling mill pressures be determined? Many noted engineers, both in the United States and abroad, are working on the problem of rolling pressures. Two of the latter have furnished interesting data, Prof. Wilhelm Tafel, Technische Hochschule, Breslau, and Dr. Ing. J. Puppe, Düsseldorf, Germany.

Our own engineers have contributed a wealth of information on this subject. No scientific body and no engineer, however, believes that this work is completed and that the results obtained so far may be accepted definitely, as absolutely accurate. It may be therefore assumed that the special committee on bearings has a lengthy program ahead.

Extensive Tests Reported in Detail

F. D. Egan, electrical superintendent of the Lackawanna plant, Bethlehem Steel Co., is chairman of the bearings committee. His report was discussed at length, with a profusion of lantern slides, by Fred Waldorf, of the Timken Roller Bearing Co., who reported upon an extensive series of tests made by his company on both the 34-in. blooming mill and the 28-in. and 22-in. bar mills. Curves were plotted showing the relation of pressures and absorbed powers to the drafts taken in the mills and the actual displacement of metal effected. The measurements have been made by means of hydraulic cylinders and registering instruments.

Use of Solid Plugs to Measure Pressures

Solid pressure plugs used in compression are employed to measure bearing loads by the Rollway Bearing Co. in experiments which have been undertaken in the Warren plant of the Republic Steel Corporation. These plugs, which are inserted between the upper roll neck and the screwdown, can be left in indefinitely, without interfering in any way with operation of the mill.

The electric connections, with current furnished from a 6-volt battery, give ammeter readings, and also can be used in connection with an oscillograph. The electric wire connection may be of any convenient length, so that the readings may be taken at a distance.

In describing this apparatus, and illustrating it by means of slides, the speaker expressed the belief that readings from a hydraulic cylinder may sometimes be erroneous. There is a certain inertia which will not permit the device to respond quickly to sudden changes in bearing pressure.

Plugs developed for the purpose of the tests mentioned are of three sizes, having capacity, respectively,

for 150,000 lb., 600,000 lb. and 2,000,000 lb. The latter plug is 10 in. in diameter and 6 in. high.

Standardized Lines of Motors and Bearings

Bearings have been developed by the various bearing manufacturers so that a standardized line of general purpose motors has been put out by the Westinghouse Electric & Mfg. Co., as shown by means of lantern slides by Mr. Brown of that company. The great advantage achieved by this step has been complete interchangeability from one type of bearing to another. This has the further advantage of making it possible for the motor maker to standardize on shaft extensions, so that a single pattern will fit any of these types of bearings.

Fatigue of anti-friction bearings was discussed by a representative of S. K. F. Industries, who stated that this phenomenon becomes apparent first through fatigue cracks in the raceways. The material flakes or spalls off, and thereby limits the useful life of the bearing. This factor must be kept in mind in connection with the use of bearings, as well as the more apparent factor of the bearing pressure.

We Want the Facts Instead of Theory

A plea for real test data in place of mere speculations was made by Ferdinand G. Gasche of the Bethlehem Steel Corporation. Managements are too prone to cut down the overhead expense of making tests whenever times are not so prosperous. What we particularly want from various sources is a set of measurements and notation on such a basis that we can speak a common language.

This speaker expressed the belief that there are powerful tangential and other stresses, in addition to the vertical stresses covered by the measurements we have been making, and that these are of great importance.

Old and New in Wrought Iron

SHARP contrast between the ball of wrought iron, after it has come to nature, being lifted out of the puddling furnace by strong arm methods, inherited from the last century, and a "thimble" of metal, handled by crane and conveyor after it has been manufactured by the Aston process. Photos courtesy of A. M. Byers Co., Pittsburgh

Products of Sheet Steel Offer Large Potential Markets

LARGE potential markets for sheet steel were outlined at the annual meeting of the National Association of Flat Rolled Steel Manufacturers at White Sulphur Springs, W. Va., last week. Ray H. Griswold of the Griswold-Eshleman Co., Cleveland, advertising agency, in presenting the results of a survey made in behalf of the trade extension work of the association, said that several lines of consumption which are considered most susceptible to important results from sales promotion work have a potential annual consumption of 8,179,465 tons of sheets, as compared with a present normal average of 2,531,545 tons.

The building industry, particularly buildings for the farm, offer the widest undeveloped market for sheet steel, it was said—a market which, if properly exploited, offers an eventual tonnage of sheets equal to that now consumed by the automobile industry, the sheet steel industry's biggest single customer.

Potential Markets for Sheets

Summarizing the possibilities in some of the fields of sheet steel consumption, Mr. Griswold gave the following facts and figures:

Office Furniture.—Total possible consumption, 7,040,100 tons; possible annual consumption, 355,420 tons; actual consumption now, 137,522 tons.

Household Furniture and Equipment.—Total possible consumption, 11,362,240 tons; possible annual tonnage, 666,587 tons; actual present consumption, 107,308 tons.

Automotive (wheels and bodies).—Total possible consumption, 34,486,400 tons; possible annual consumption, 1,724,320 tons; present annual consumption, 1,239,850 tons.

Pressed and Welded Steel.—Total possible consumption, 18,000,000 tons; possible annual consumption, 900,000 tons; present annual consumption, 244,000 tons.

Steel Shelving.—Total possible consumption, 4,683,000 tons; possible annual consumption, 234,450 tons; present annual consumption, 97,700 tons.

Metal Lath.—Total possible consumption, 12,000,000 tons; possible annual consumption, 600,358 tons; present annual consumption, 89,130 tons.

Standard Steel Buildings.—Total possible consumption, 13,322,000 tons; possible annual consumption, 686,100 tons; present annual consumption, 20,000 tons.

Building Material.—Total possible consumption, 18,788,600 tons; possible annual consumption, 939,430 tons; present annual consumption, 126,050 tons.

Electric Light and Telephone Poles.—Total possible consumption, 3,956,000 tons; possible annual consumption, 197,800 tons; present annual consumption, 1700 tons.

Farm Market.—Total possible consumption, 34,475,000 tons; possible annual consumption, 1,875,000 tons; present annual consumption, 486,285 tons.

Other Increasing Steel Uses

The foregoing are the lines in which the association will concentrate its advertising and sales promotion efforts. There are other minor channels for use of sheet steel which are considered to be susceptible of marked expansion.

For example, steel doors and interior trim for buildings now take about 88,200 tons of steel a year, whereas the potential market is regarded as 584,280 tons a year. Steel in steel roof decks requires about 25,000 tons a year, with a potential market of 254,450 tons a year, according to the estimates established by the association's survey. Steel partitions consume 15,850 tons, with a possible market of 82,500 tons annually. If all automobile bodies were solely of steel, eliminating some that are now of composite construction, the sheet steel used for this purpose, on the basis of 4,000,000 cars annually, would be 1,500,000 tons, as against a presented estimated consumption of 1,150,000 tons. Refrigerators now account for an annual steel consumption of about 32,000 tons, with a possible market for 94,100 tons. Bedroom furniture now takes 58,120 tons, whereas the potential market is estimated at 349,362 tons.

Filing Cases 95 Per Cent Steel

As proof that these possibilities for expansion of sheet steel uses are actual and not fanciful, the case of filing cases was cited. For this product steel has almost entirely replaced wood, so much so that 95 per cent of all filing cases, it was stated, are now made of steel. As showing how the use of steel office desks is increasing, it was stated that 27,000 steel desks were made in 1925 and 137,500 in 1929. For office desks the annual steel consumption is 21,600 tons, with a potential market estimated at 59,000 tons annually.

As a suggestion of the possible market for sheet steel in building construction, a point was made of the fact that the use of flat rolled steel for buildings increased 36.6 per cent from 1928 to 1929, despite the fact that during the same period there was a decline of 17.7 per cent in building construction, as measured on a footage basis.

Advertising Directed to Ultimate Consumer

The advertising program of the Trade Research Division of the National Association of Flat Rolled Steel Manufacturers is now being directed to a greater extent to the ultimate user of the products made from sheet steel. This great consumer market was visualized by Mr. Griswold as including 4,000,000 buyers of automo-

STEEL LEADERS' VIEWS ON BUSINESS OUTLOOK

E. P. THOMAS, vice-president, United States Steel Corporation, addressing the National Association of Flat Rolled Steel, said that the steel industry has now arrived at such a low price basis that further cuts would seem to be unnecessary and impossible from the standpoint of costs. "Our customers," he said, "are more interested in the stability of their own market than in the temporary advantages of price concessions." Mr. Thomas said he believed the steel industry is at the dawn of a brighter day.

George M. Verity, chairman, American Rolling Mill Co., said that it would be unreasonable to expect improvement in steel business during the summer months, but he predicted that in not many months the steel industry will again be busy. He thought that a substantial upturn would be in evidence by the first of the year.

Frank B. Frost, president, Superior Steel Corporation, Pittsburgh; Eugene P. Thomas, vice - president, United States Steel Corporation, New York; Joseph B. Andrews, president, Andrews Steel Co., Newport, Ky.; Henry Roemer, president, Superior Sheet Steel Co., Canton, Ohio, subsidiary of Continental Steel Corporation; Walter E. Watson, vice-president in charge of sales, Youngstown Sheet & Tube Co.; Frank A. Moeschl, vice-president in charge of sales, Newport Rolling Mill Co., Newport, Ky.

biles, 6,000,000 office workers, 20,000,000 housewives, 6000 architects, 6,000,000 farmers, 135,000 contractors and builders, 25,000 engineering staffs and several hundred thousand dealers.

A point emphasized by Mr. Griswold is that the expansion of markets for sheet steel involves no necessity to increase capacity. He said it would be calamitous if the steel industry continued to expand its capacity when the great need is to find new and increasing outlets to supply the existing capacity, which has been so greatly added to in the past few years by the perfecting of the continuous rolling process. Rather, he said, the steel industry should be content to hold its own under existing conditions and prepare for new markets that will occupy its facilities and stabilize its selling prices in good times.

In view of the large amounts of money that are being expended in the promotion of aluminum, copper and other metals, which to some extent are encroaching on the use of steel, there was sentiment in favor of much larger appropriations for sales promotion and advertising work. A fabricator of steel products who said he would gladly pay $2 a ton more for sheets if 10 cents of that amount were devoted to advertising that would help him to widen the market for his products was roundly applauded.

Farm Market Offers Large Possibilities

This speaker was Carl Oberlin of the Martin Steel Products Co., Mansfield, Ohio, whose products are steel buildings for the farm. Mr. Oberlin said that the farm offers a potential market for 3,000,000 tons of steel annually, which was a somewhat more optimistic prophecy than that of the association's own survey. Barns, corn cribs, grain bins, poultry buildings and hog houses were among the steel farm products which he said offered great possibilities for development. It would take 5,000,000 tons of steel sheets, Mr. Oberlin said, to replace all of the corn cribs on the farms of the United States.

Predicting that the farmer would again become the country's biggest buyer, Mr. Oberlin said that, having had 10 bad years, the farmer would come back into his own. Farm buildings, on the whole, have not been replaced or rebuilt since the war, and the farm market, in his opinion, is ripe for tremendous development in steel consumption.

The mechanized farm will be one of the means of opening up this market, the speaker said. A large farming corporation in Kansas, it was remarked, had through modern methods and equipment reduced the cost of producing wheat to 24c. a bushel, although $1 has heretofore been considered the average cost.

A big dammed-up farm demand, it was predicted, will aid the steel industry materially, and the introduction of more efficient farming methods will give this potential demand an added boost.

Fabricators Applaud Promotion Work

Mr. Oberlin and other users of sheet steel spoke of the great value of the association's advertising campaign in stimulating the demand for products made of steel. W. W. Galbraith of the Youngstown Pressed Steel Co., Youngstown, said that his own company, through a sales campaign last year, supplied stamped steel parts for washing machine manufacturers, who resorted to steel because the high price of copper added so greatly to the cost of their finished products. His own company supplied steel parts that replaced 11,500,000 lb. of copper and aluminum. Pointing out the possibilities for the use of steel, he said that lawn mowers

James Lippincott, president, West Leechburg Steel Co., Pittsburgh; J. B. Griffin, vice-president, Griffin Mfg. Co., Erie, Pa.; Severn P. Ker, president, Sharon Steel Hoop Co., Sharon, Pa.; Ralph M. Roosevelt, New York, president, American Zinc Institute.

had been made of pressed steel, handle and all.

Avery Adams, of the General Fireproofing Co., announced that his company is now prepared to engage in the manufacture of steel store fixtures and shelving, a $100,000,000 market whose raw material now is largely wood.

E. P. Thomas, vice-president, United States Steel Corporation; George M. Verity, chairman of the board, American Rolling Mill Co.; H. T. Gilbert, vice-president in charge of sales, Republic Steel Corporation; Severn P. Ker, president, Sharon Steel Hoop Co.; F. C. Gifford, vice-president, Acme Steel Co., and others spoke highly of the work in advertising and market development that is being done by the association, and some stressed the need for a larger tax upon the manufacturers of flat rolled products to do the job in a much bigger way than present appropriations make possible.

Steel Industry Should Aid Its Customers

Mr. Thomas said that he does not believe the steel industry has gone far enough to assist its customers in presenting their goods to the ultimate consumer. He said that a committee has been formed in the Steel Corporation to investigate particularly the possibilities for use of steel in houses, barns and roof decks. He added that the recently organized trade research division of the Steel Corporation would cooperate with the association's activities along similar lines.

Mr. Verity said that there is an unlimited field for the use of steel, but it must be exploited.

Mr. Ker explained that he is a comparatively recent convert to the use of advertising in a big way, but that now he is thoroughly "sold" on its effectiveness for the purpose back of the association's program.

Mr. Gilbert said that publicity is a definite part of the Republic Steel Corporation's program, and that this work would be dovetailed with that of the association's trade research division.

George M. Verity, chairman, American Rolling Mill Co., Middletown, Ohio

Banker Discusses Cooperative Promotion

The gathering of steel executives was undoubtedly inspired by the address of Francis H. Sisson, vice-president, Guaranty Trust Co., New York, who discussed the opportunities that exist in the steel industry for cooperative trade promotion.

"The basic industries supplying standardized products that are not bought by individuals, but become the raw material from which other products are made, have been comparatively slow," said Mr. Sisson, "to undertake campaigns in the field of public relations. In steel, for example, immense progress has been made in productive technique, but comparatively little attention has been devoted to the problem of merchandising. Apparently, it has been supposed that a standard product like steel must compete mainly on a price basis and that the most important competition a steel company must face is the competition offered by other steel companies.

"This illusion is gradually being dispelled. The need for modern distributive methods is not confined to those branches of business that are engaged in selling directly to the ultimate consumer. Markets, whether for producers' goods or consumers' goods, must be actively sought out. Not even steel, essential and widely known as it is, can sell itself and maintain its place in our economic system through its intrinsic merits alone.

"Steel producers, like the producers of any other commodity, will fall behind in the race unless their sales are promoted by modern, efficient and aggressive methods of distribution, analysis and development of markets, national advertising and other devices utilized today by our progressive industries in disposing of their products.

Steel Industry Has Been Backward

"In the matter of group action in stabilizing and protecting its welfare as an industry, and particularly in

John P. Hosack, vice-president, Mahoning Valley Steel Co., Niles, Ohio; George L. Wick, Mahoning Valley Steel Co.; E. L. Wetstein, Michigan Steel Corporation, Detroit; W. W. Galbraith, Youngstown Pressed Steel Co., Youngstown; L. D. Mercer, manager of sheet steel sales, Republic Steel Corporation, Youngstown; Frank Meyer, vice-president, Inland Steel Co., Chicago; Fred Loomis, Republic Steel Corporation.

John L. Harrison, Wheeling Steel Corporation, Wheeling, W. Va., and J. E. Wetzel, Superior Steel Corporation, Pittsburgh

carrying on research and publicity to hold its present markets and expand the use of its products, the steel industry has been backward. In consequence, other products have invaded steel markets; and it is clear that, in many cases, this development has been due to aggressive sales effort on the part of the competing industries rather than to any intrinsic superiority of their products.

"The need for concerted action is stronger by reason of the present economic position of the steel industry as a whole. There are several important branches of American manufacture in which the increase in plant capacities was greatly stimulated by the sudden and abnormal war demand, and in which later influences have tended to perpetuate the overexpansion thus brought about. Steel is one of those industries. Only at rare intervals does the industry as a whole approach a capacity rate of operation. As a result, fixed charges are high and prices are low—a situation that is aggravated by the efforts of individual producers to make the greatest possible use of existing facilities, even at the sacrifice of price margins.

"Earnings of steel producers in the prosperous years through which we have been passing have not compared well with those in most other lines of business, and it is significant that the higher rates of return are found among those industries that use modern methods of national advertising and sales promotion. If the steel industry had applied such methods years ago, we might find a very different situation today with respect to output and earnings.

Needs Sound Sales Policies

"The steel industry needs better salesmanship, national advertising, sales promotion, technical research and all the other methods of market extension. It needs the practical merchandising methods and sound

Avery Adams, General Fireproofing Co., Youngstown

sales policies that have been used so effectively by its competitors. But, in the realization of these aims, the first problem is to obtain concerted action. The need is one that is common to all makers of steel; the benefits will accrue to all; and the cost should be borne by all."

Another guest speaker was Ralph Roosevelt, president, American Zinc Institute, and vice-president, Eagle-Picher Lead Co., New York, who offered the cooperation of the American Zinc Institute in the promotion of markets for galvanized sheets. He also said that the association he heads will devote funds for research to improve methods of galvanizing.

Convention of Steel Mill Engineers

Electrical Association Men Hold Five-Day Meeting and Exhibition in Buffalo

FROM June 16 to 20 the Association of Iron and Steel Electrical Engineers held its annual convention at the Hotel Statler, Buffalo. There were intensive technical sessions, occupying most of the mornings and some of the afternoons, including one morning with three simultaneous sessions. There were two plant visits of major importance, as well as visits to other plants, and there was an exhibition occupying the entire floor space of the Broadway auditorium, about one mile from the hotel.

The program of the meeting, so far as it was of major interest to THE IRON AGE readers, was given in our issue of June 5, page 1698. A number of the papers will be abstracted in our columns, together with some of the discussions. A portion of this material appears on other pages.

At the annual business meeting Roland M. Hussey of the Jones & Laughlin Steel Corporation, Aliquippa, Pa., was named president for the ensuing year. Fred O. Schnure of the Bethlehem Steel Co., Sparrows Point, Md., is the new first vice-president. Jesse B. Booth, National Tube Co., Gary, Ind., is second vice-president and William E. Miller, Bethlehem Steel Co., Johnstown, Pa., secretary. James Farrington, Wheeling Steel Co., Steubenville, Ohio, who has been treasurer for many years, retains that office.

Westinghouse Standardizes on Steel Desks and Chairs

About 10 years ago the purchasing department of the Westinghouse Electric & Mfg. Co. was instrumental in the organization of a committee to investigate desks and chairs for various uses throughout the company's works. At that time there were in use desks and chairs of every possible make and description, and all of this equipment was of wood. A replacement program, which calls for the use of steel equipment instead of wood desks and chairs, was outlined at the recent Chicago convention of the National Association of Purchasing Agents by C. G. Bunnell, purchasing agent for the Westinghouse company.

This replacement program requires the purchase of steel equipment for the offices and transfer of wood equipment to shop offices in the works. This transferring continues until the wood desks reach the bonfire. Soon after a standardization committee was organized it was found that this program would have to be worked in close cooperation with desk and chair manufacturers, and eventually as this program became more crystallized the work was narrowed down to one desk company.

An important requirement imposed by the committee was that all drawers be interchangeable in each desk and that all drawers must be suitable for use in all desks. This standardization permits great flexibility. The company can now move a department in a remarkably short time simply by the interchange of the drawers. The bodies of the desks remain in place.

Julius H. Barnes, chairman, United States Chamber of Commerce; C. S. McCain, chairman, Chase National Bank, and M. H. Aylesworth, president, of the National Broadcasting Co., have accepted invitations to address the seventh conference of major industries to be held on Oct. 22 at the University of Chicago, under the auspices of the university and of the Institute of American Meat Packers.

Recovery Not Likely Before September

BY LEWIS H. HANEY
Director, New York University Bureau of Business Research

FAVORABLE FACTORS

1.—Building activity at or near bottom levels.
2.—Production being curtailed and prices being readjusted.
3.—Federal Reserve and banks at large centers in a strong position; high Federal Reserve ratio and large net reserves of member banks.

UNFAVORABLE FACTORS

1.—Continued decline in commodity prices.
2.—The P-V line is below normal and declining.
3.—Stocks of many commodities are large.
4.—Exports and imports low and declining.
5.—Employment and payrolls low and declining.
6.—Farm purchasing power reduced further.
7.—Low railroad freight traffic and earnings.
8.—Congested bond market.
9.—Collapse in stock market prices.
10.—High collateral loans and loan-deposit ratio; much frozen credit.
11.—Political outlook extremely disturbed.
12.—Machine tool orders (adjusted) decline sharply; steel sheet sales show largest decline in years.

OF the few favorable indications none is of a positive character. The most reassuring factor is found in indications that building activity may be at bottom levels, but no sustained recovery is yet indicated. Business men are facing the situation squarely—perhaps now with even too much pessimism. But, while this means that at last the necessary readjustments are being made, the process will take time. Meanwhile, curtailment and liquidation are the order of the day.

The unfavorable indications are more clearly predominant than at any time in the writer's experience. Of course, sooner or later, this condition will indicate the "darkest hour." We may look forward to ultimate recovery with complete confidence. For the next few months, however, business barometers based on cold facts point downward.

Raw Materials Must Turn Upward

Commodity prices have made new lows in the current recession and the Bureau of Labor Statistics index is getting close to pre-war levels. There is no prospect of business recovery until the prices of raw materials turn upward.

The P-V line continues its downward trend, though gradually, and is well below normal. It indicates a gradual recession in business, with no sustained recovery for at least three months. It shows the pressure of supplies of commodities on markets in which the demand is relatively weak. As usual, the trend of steel production is turning in the direction indicated by the P-V line, and further declines of more-than-seasonal proportions seem probable.

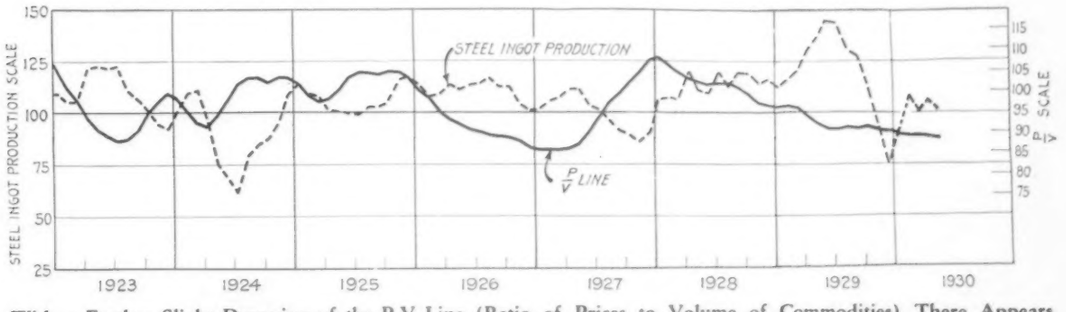
Excess Stocks Must Be Worked Off

Next to the anticipated rise in the prices of basic commodities, and closely connected therewith, the most significant factor now is probably to be found in the stocks of commodities. When large excess supplies of zinc and copper, for example, begin to decline, we may look for the start of a business recovery. Of this, there is yet no sign.

Valuable, as an indication of the trend of the business cycle, is the employment of factory labor. This continues in a distinctly downward direction. A general more-than-seasonal decline occurred in May, notably in the metal trades. Payrolls declined also. As farm income is being reduced by low prices and small marketings, the general purchasing power of the people is lower.

While there is now some danger of going to the extreme in pessimism, it is still wise to proceed with caution. We may look across the valley toward the upward slope, but our path is likely to be a downward one during the summer, and possibly into the autumn.

(The next article by Dr. Haney will appear in the issue of July 10.)



With a Further Slight Dropping of the P-V Line (Ratio of Prices to Volume of Commodities) There Appears Little Chance of a Comeback Inside of Three Months

This Issue in Brief

Finds gas more economical fuel in heat treating alloy steels at high temperatures. Gas Association engineer declares that electric heating elements deteriorate rapidly at elevated heats.—Page 1882.

* * *

Business barometers based on cold facts point downward for the next few months, says Dr. Haney, but we may look forward to ultimate recovery with complete confidence.—Page 1903.

* * *

Costs can be cut by giving each individual workman cost data. The best way to make the workman expense-conscious is by means of an incentive plan, permitting him to share in the reduction of controllable expense items.—Page 1879.

* * *

Efficiency of the plant depends largely upon the foremen. Without the foreman's support wastes in the factory cannot be eliminated. Foreman training is the quickest and surest method of securing maximum efficiency.—Page 1877.

* * *

New form of gas heating will revolutionize the art of heating lead and salt baths, gas engineer believes. It is immersion heating, using completely premixed air and gas mixtures of perfect proportions, so that complete combustion is obtained.—Page 1882.

* * *

Do not gear the plant up to maximum demand. Increasing plant capacity to accommodate the peak of boom times places a heavy burden on it in normal and dull times.—Page 1892.

* * *

Sixty-foot plate weighing 15 tons is charged into normalizing furnace by specially built charging machine. Bed of machine consists of four fingers, over 60 ft. long.—Page 1885.

Large structural shop, built near the site of the job, fabricates large arch bridge. Eighteen million-dollar bridge across Sydney harbor, Australia, will contain 50,000 gross tons of steel, much of it normalized silicon-manganese steel.—Page 1884.

* * *

Foundry cost estimates vary widely, even when well recognized methods of computing costs are used. On one job large foundries having cost systems figured costs all the way from 1.2c. to 3.2c. a pound.—Page 1883.

* * *

Unless the foreman knows what it costs to operate his shop, he cannot be expected to know where or how to effect a saving, either in the cost of production or maintenance. Knowledge of shop expense impels a desire to economize.—Page 1940.

* * *

Advantages gained by improved plant facilities and greater efficiency are only temporary, writer declares. Economies permit a price reduction. Competitors are forced to adopt similar tactics. In the end, capacity in an already overbuilt industry is increased.—Page 1892.

* * *

Under the new General Electric Co. unemployment plan, each worker who wishes to enroll will pay 1 per cent of his earnings. He stops paying dues when his wages drop to 50 per cent or less. During lay-off employees will receive half-pay, but not to exceed $20 a week, and not for more than 10 weeks in any 12 consecutive months.—Page 1939.

* * *

Is the time near when the open-hearth furnace can be designed as a one-way furnace? With the present method of draft reversal, a favorable heat balance is hard to get.—Page 1890.

For best results with open-hearth furnace control, deeper checkers are needed than in usual practice. A fan is used to supply sufficient cold air at the time when it is most needed; at the start of a heat on cold stock.—Page 1889.

* * *

Steel with markedly superior physical properties, at no increase in price, is claimed for new process. "Densite," a patented mixture of carbon and other chemicals, is added to the molten steel in the ladle. Its manufacturer declares that the gas created by the addition of the material helps eliminate the major portion of the inclusions.—Page 1896.

* * *

Do not get caught in a closing market. When the product is new and the mass demand unsatisfied, the rate of sales increase may be large. But when the "saturation point" has been reached (as in the case of radio, electric washing machines, automobiles) watch out that you do not provide too much plant capacity to care for the share of the business you can reasonably expect to get.—Page 1891.

* * *

Ford Motor Co. finds that in forming rustless steel the various operations must be continuous. For rustless steel, though 20 per cent more ductile than ordinary steel, loses its ductility faster during the drawing stages.—Page 1887.

* * *

Purchasing agents can "beat the foundries to death," says foundryman. For one cost system will give a high figure on one type of casting and a low figure on another. The shrewd buyer will shop around and buy from the foundry using the cost system favorable to a low price on that particular job.—Page 1883.

Hydraulic Feed for Laidlaw Band Saws

LOW-PRESSURE hydraulic feed has been developed by William Laidlaw, Inc., Belmont, N. Y., for use on the company's metal-cutting band saws.

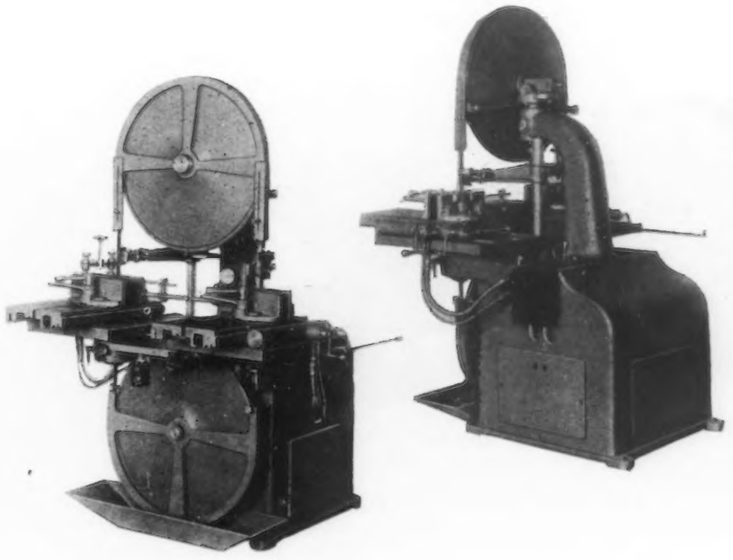
Because of the narrow kerf of the metal band saw, the power required to feed it into the work is only a fraction of that required to feed the average machine tool. Furthermore, in the case of a metal cutting band saw, which is very flexible, especially when cutting large diameters requiring a considerable distance between the supporting saw guides, the high pressures used in connection with the standard types of hydraulic feeds are said to be neither necessary nor desirable.

The Laidlaw low-pressure hydraulic feed consists of a small rotary type piston pump, oil reservoir, pressure-regulating valve, relief valve, pressure gage, cylinder, piston, control valve, and piping to conduct the oil from the reservoir through the pump and cylinders and back to the reservoir. The pump, reservoir and piping, except the short flexible metallic hose connections to the cylinders, are housed in the base of the machine. The pump is direct coupled to the main-drive shaft.

The illustrations show the hydraulic feed applied to the company's type CMT saw. Being of the double-cutting type this machine is equipped with two cylinders and the necessary additional piping to connect them to the system; otherwise the arrangement is the same as on the single cutting machines. The cylinders are mounted on the top of the tables, beside the movable carriage and the piston rod is connected directly to the carriage. Between the brass lining of the cylinders and the side walls there is a chamber into which the oil is pumped from the reservoir through a ported rotary valve. This chamber is separated into two compartments by a ring cast on the inside of the cylinder and bored to fit the outside of the brass lining. The rotary control valve is located so that its center coincides with this dividing ring and oil can be admitted to either end of the cylinder. The oil is returned to the reservoir through an adjustable needle valve and this valve controls the speed at which the carriage is fed forward.

The mechanism is designed so that when the control valve handle is moved to its extreme position the ports are brought to full opening, thus providing a rapid traverse for the return of the carriage. An adjustable tappet is provided to close the control valve and stop the feed when the carriage has traveled a predetermined distance, but because of the low pressure used (approximately 50 lb. per sq. in.) no damage can be done even if the tappet is not used. A positive stop attached to the front vise jaw prevents the saw from cutting into the vice. This stop causes the relief valve to open and permits the oil to be returned to the reservoir.

Although it has been found that pressure of about 50 lb. per sq. in. is adequate for ordinary cutting, pressure of 100 lb. per sq. in. can be obtained if desired. A pressure gage located on the column, as shown, may be seen easily by the operator.



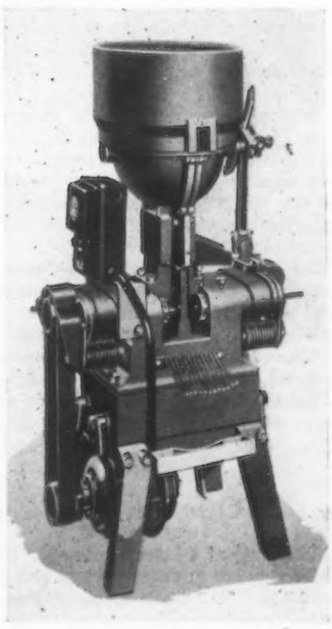
The Hydraulic Feed May Be Used on Either Single or Double Cutting Band Saws. Pressure of 50 lb. per sq. in. is adequate for ordinary cutting, but 100-lb. pressure may be had if required

Double Countersinking Machine for Nuts

A MACHINE for countersinking both ends of the hole in square or hexagon nuts has been placed on the market by the Kent Machine Co., Cuyahoga Falls, Ohio. The machine is fully automatic in its action and has been developed to meet demand for a high-grade product, and to assist in production by simplifying operations on the bar machines and in the tapping operations.

Nuts coming directly from the bar machines, when placed in the hopper, are automatically delivered to the feeding chutes, from which they are fed to a position in line with the countersinking spindles. Both ends of the hole in the nut are countersunk simultaneously to the same depth. Then the nut is automatically ejected from the machine, and passes over a grid for removal of chips.

The hopper is unique in design, with galleys or feeding chutes leading to a set of countersinking spindles on each side of the machine. It is really a hopper with double feed. The hopper is adjustable for different sizes of nuts. Interchangeable feeding chutes are employed to meet the varied requirements of diameter and height of product.



The combination of the double hopper feed with two sets of opposed spindles operating on each side of the machine results in large production.

Drive is from a motor underneath

the machine, by belt to the driving shaft. One camshaft controls the entire cycle of operation. The countersinking tools are quickly and easily inserted and set, as occasion may demand. They will run for a long time at each setting, due to the small amount of service they are called upon to perform.

This double countersinker is built in two sizes, nominally called ½-in. and 1-in. for countersinking standard nuts up to ½-in. diameter and from 9/16-in. to 1-in. diameter respectively.

Turret Lathe Uses Tungsten-Carbide Tools

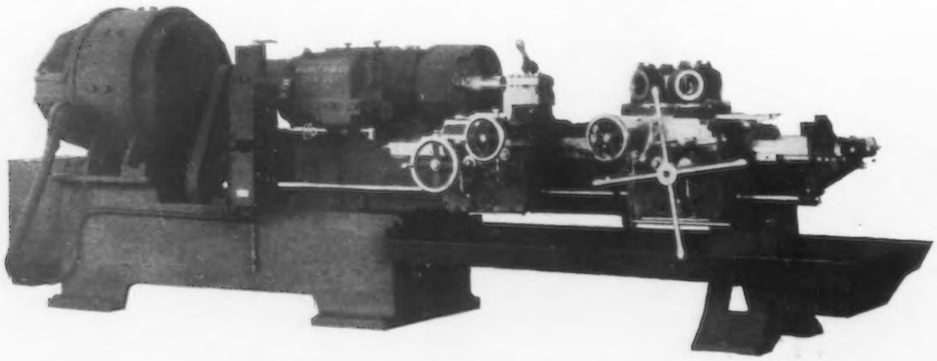
TO permit taking full advantage of tungsten-carbide tools, both as to production and precision, in machining phosphor bronze bearings, the Acme Machine Tool Co., Cincinnati, has recently furnished the turret lathe illustrated.

This machine is a Duo-Control turret lathe equipped with a 25-hp. adjustable-speed motor connected directly to the spindle by flexible coupling. Intermediate gearing is eliminated and a large and steady flow of power is provided. Spindle speeds ranging from 300 to 1200 r.p.m. at full load are obtainable through rheostats, one of which is a vernier arrangement for the finer adjustments. Starting, stopping and breaking are controlled electrically.

The company's standard roller-bearing spindle employed is emphasized as being unusually suitable for high speeds, this spindle having a double set of Timken bearings on the nose end and a floating roller bearing on the rear end. These bearings are positively lubricated and the oil is pumped through a Purolator. The pump is driven by the constant-speed motor which drives the turret quick motion.

Twelve independent reversible feed changes are provided for the main and the cross-slide carriage, all feed changes being made at the aprons, which arrangement eliminates scattered control levers. Feed changes are made through sliding gears mounted on squared shafts which are carried in anti-friction bearings. The feed mechanism, entirely inclosed, runs in oil.

Either a fixed center or a cross-sliding turret, hexagon or flat type, can be furnished. The square turret carriage is rigidly mounted on both the front and the rear vees of the bed, giving firm support to the tooling. Power rapid traverse is provided for longitudinal movement of the main carriage. Standard engine-lathe type taper and chasing attachments can be furnished.



A 25-Hp. Adjustable-Speed Motor Drives This Turret Lathe, for Machining Phosphor Bronze Bearings with Tungsten-Carbide Tools

Offers a New Type of Sand Rammer

A NEW type of sand rammer has been recently designed and put on the market by the Cleveland Pneumatic Tool Co., Cleveland. It bears the trade name Cleco, and is made in suitable sizes for all classes of foundry ramming. It has several new features which are said to improve operation, to speed up production and to lengthen the life of the new tool. Among the new features is an automatic lubrication system, consisting of an oil reservoir placed in the head of the rammer. The main valve of the rammer is pressure-seated at both ends, which is claimed to be a new type of valve construction. There is a special dust-proof feature consisting of a packing gland placed in the front end of the rammer cylinder. The cylinder of the rammer is made of special alloy steel capable of deep hardening of the walls of the cylinder bore.

Automatic Lubrication, Pressure-Seated Main Valve and Dust-Proof Packing Gland Are Features of This Sand Rammer

Bell-Type Production Nitriding Furnace

PRODUCTION nitriding furnaces of 1000 and 3500-lb. capacities, respectively, embodying the bell type of construction, have been developed by the Westinghouse Electric & Mfg. Co., East Pittsburgh. The furnace consists of a movable bell, rectangular in shape, well insulated and equipped with heating elements around the side walls. With each furnace bell two bases and two metal nitriding box containers are supplied. The bases are also equipped with heating elements to insure even heating of the charge.

Crane facilities are necessary for handling and transferring the furnace bell from base to base.

The metal nitriding boxes are mounted on top of the bases, and gas pipe connections are made permanently to each nitriding box. The boxes have a V-shaped seal trough around the upper edge for lead or other soft metals, into which fits a tapered seal lip on the cover. The cover is also clamped down by wedges, so that a proper seal can be effected before the lead is melted, to allow ammonia gases to be passed into the box to exhaust all of the air before the heat is turned on.

Ammonia gases are fed into the bottom of the loaded nitriding box through three separate gas distributing pipes. The end pipes are U-shaped and the center pipe is shaped like the letter H. These gas inlet pipes are properly perforated to allow uniform distribution of the ammonia gas throughout the box. Also two U-shaped outlet gas pipes are provided near the top of the box and a pressure relief pipe is provided at the bottom.

In operation, the charge is loaded into the nitriding boxes and the cover is tightly secured. Ammonia gases

are then turned on to exhaust the air. (Better nitriding results can be obtained by having the box completely filled with ammonia before the cycle is started.) When the heating and soaking cycle has been completed, the furnace bell can be transferred to the second base, allowing the first charge to cool in its nitriding box with gas connections still maintained to the ammonia gas supply.

The economy of the bell type of furnace is high because it is not necessary to leave the bell portion of the furnace over the nitriding box during the cooling cycle, and the heat absorbed in the bell is retained when transferring to the second base.

Bolt-Head Trimmers Separate Work and Chips

BOLT-HEAD trimmers are used to trim cold-headed bolt and screw blanks, to produce square, hexagonal or other shaped heads. Machines of this classification made by the Waterbury Farrel Foundry & Machine Co., Waterbury, Conn., have been redesigned recently. It is now possible, the manufacturer says, to obtain higher quality output and greater speed.

The redesigned rotor feed is said to be an outstanding improvement on these machines, due to the fact that blanks of various lengths, within the rated capacities for diameter, can now be fed with equal facility and without interruption. The blanks are agitated within the hopper by a paddle-wheel type of rotor, and the chute is specially constructed to prevent clogging.

Blanks pass from the hopper down the chute, the passageway being kept clear by a belt-driven wheel of novel construction. At the lower end of the chute, an escapement device holds back the column of blanks and allows but one to drop out at a time.

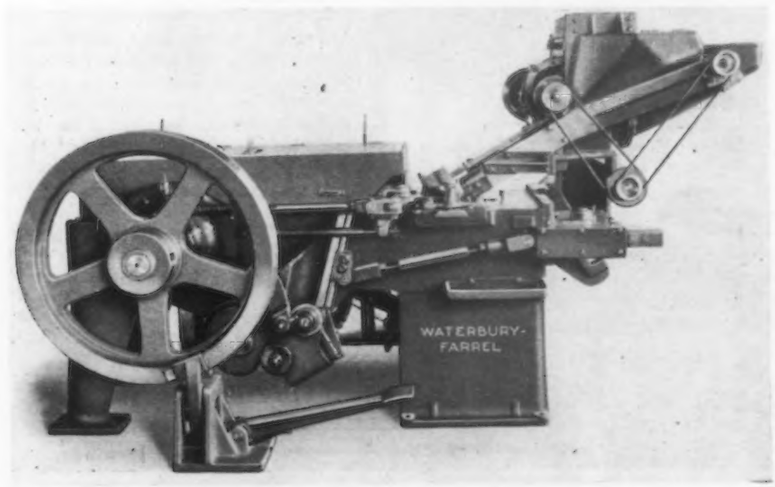
After leaving the chute, the blanks drop into pocket blocks on a cross-slide and are carried over to the center line of the machine. Here a pair of spring fingers on a rock arm picks them out of the pocket blocks. The arm swings down so that the spring fingers hold the blank horizontally, directly in line with the die and hollow punch.

When the die, located in the gate, advances, it pushes the blank partly into the punch before the fingers snap off the blank as the rock arm swings up to its starting position. The gate and die continue to advance, pushing the blank into the stationary punch in the frame as far as it will go, thus completing the trimming operation.

The gate dwells when in its forward position, holding the trimmed flash between the die and punch. Meanwhile the knockout pin advances through the hollow punch and pushes the trimmed blank back through the die. The blank falls out, through an opening in the gate back of the die, into a receptacle. The flash drops into a separate container. Thus the work and chips are automatically separated, a feature of the new design.

Machines are built for either countershaft drive by belt or individual motor drive by gearing. In the latter the motor is entirely inclosed in a housing which forms the rear support of the machine. Special attention has been given to guard adequately the drive and other moving mechanisms. The gate, pitman and all related parts are protected by a hinged cover which can be swung back by conveniently located handles.

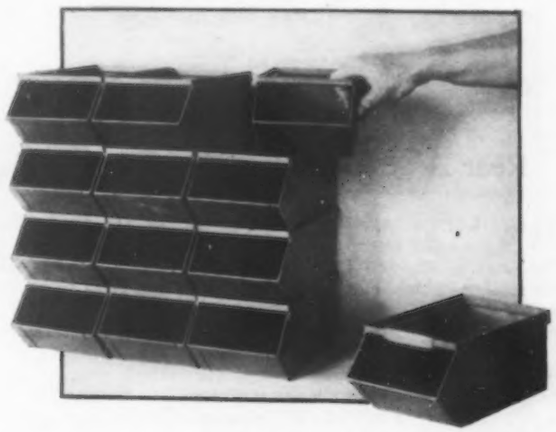
The machines are built in three standard sizes, rated for ⅜-in., ½-in. and ¾-in. diameter bolts. Respective production ratings are 115, 80 and 65 bolts a minute. Suitable adjustments are provided to take care of different diameters, lengths and head sizes.



Operating Side of ½-In. Bolt-Head Trimming Machine, Belt Driven

Nesting Bin for Assembly Bench and Stockroom

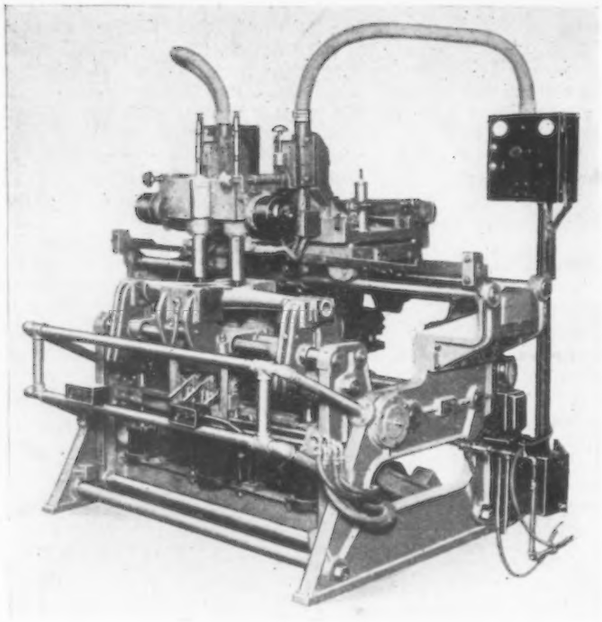
A NEW nesting bin developed by the Simplex Tool Co., Woonsocket, R. I., is intended for use in the stockroom or in assembly work, as the bins may be stacked, permitting ready access to the parts needed. When used on an assembly bench, 20 of these containers of parts may be placed in a space 10 x 22 in., while open pans of the same size would occupy 20 x 56 in. The contents are always visible and the empty containers may be removed for replenishing.



NESTING Bins for Assembly of Small Parts, and for Use in Toolrooms and Stockrooms. Twenty of them occupy bench space of 10x22 in.

When used in the stockroom they may be stacked in the order desired and filled bins taken to the shop as parts are needed. For inventory, it is suggested that counting parts may be avoided by weighing the bins to obtain the quantity of parts contained.

The design is such that the bins do not unpack unless lifted, the rim on the top of each box being sufficiently wide and high so that vibration does not affect it. Where the hand enters the bin the metal edges are turned, presenting a smooth, rounded edge. Card holders may be attached, as shown on the single bin in the accompanying illustration. Special sizes of these containers are available in addition to three standard specifications, 5½ x 10 in. x 4 in. in height, 7½ x 12½ in. x 5¼ in. in height and 9 x 15 in. by 6½ in. in height. All bins are lacquered in olive green and are furnished with or without card holders.



REAR Axle Housings Are Arc Welded Automatically at the Rate of Approximately 25 an Hour. The housings are welded as they come from the presses, formed in two parts

Rear Axle Housings Arc-Welded Automatically

RAPID and economical operation in the manufacture of rear axle housings is claimed for the machine illustrated which employs the "electronic tornado" process of automatic carbon arc welding.

The machine consists of two automatic welding heads and clamps for holding the housings. The welding heads are driven across the seam to be welded and returned to the starting position by automatically controlled electric motors. The axle housings are placed in the machine as they come from the presses, formed in two parts. The jig which holds them is tilted down toward the operator, while the housings are being inserted. The jig is then swung back into position and the two arcs struck simultaneously. The welding heads travel across the seam, in opposite directions; at the extreme end of the housing they strike a limit switch which automatically interrupts the arc and returns the heads to the starting position, ready to repeat the cycle. The housing is then turned 180 deg. and positioned for welding the reverse side.

The welding current for this machine is furnished by "Stable Arc" welders manufactured by Lincoln Electric Co., Cleveland. A 400-amp. welder is employed for each separate head.

Use of this automatic welding machine is said to save trimming of halves before weld; save trimming flash after weld; save broaching inside; save press operation of coining the reinforcement; save cleaning out flash on inside by hand; and save stock. Production is in the neighborhood of 25 housings an hour, depending upon the size of the center opening. The housings are prepared for the machine by coining up the edges of the pressed halves. These coined edges throw up a lip which increases the thickness of the material along the edge to be welded.

Electric Rotary Retort Carburizing Furnace

AN electric furnace for pressure carburizing has been placed on the market by Hevi Duty Electric Co., Milwaukee, Wis. It has a rotary retort, licensed under patents owned by American Gas Furnace Co.

The furnace illustrated is of the 600-lb. size, although it is built up to 1200-lb. capacity. It is made of an outer steel shell substantially reinforced and insulated.

Heating elements line all four sides of the furnace chamber and are of the Hevi Duty round rod nickel-chromium type. The elements are mounted in radiant type refractories which reflect heat directly to the retort. Three zones of control secure an even temperature throughout the length of the retort.

The furnace is mounted on sturdy steel legs with an operating mechanism that tilts the retort backward and forward to facilitate charging and discharging.

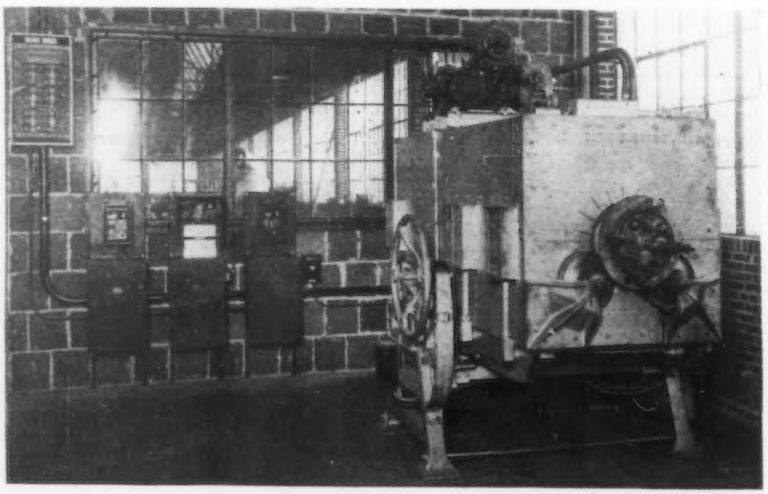
Insulated plugs are used to close the retort both front and rear, being easily removable for free access for loading and unloading.

Pyrofax gas under pressure is normally used. This is a light fraction obtained from casing head gasoline, and is of uniform chemical and physical properties. It is furnished in cylinders, liquefied under pressure, by Carbide & Carbon Chemicals Corporation. Light hydrocarbons are cracked into carbon hydrogen, and heavy hydrocarbons in the retort at operating temperatures and the carbon is absorbed by the steel. Artificial and natural gas as well as carburizing compound may also be used.

The case formed with Pyrofax gas under pressure is exceedingly uniform on the parts treated, and with ordinary normalized carburizing steels a penetration of 1/16 in. in 5½ hr. takes place at 1675 deg. Fahr.

This gas furnace eliminates all dust of solid carburizers, effects economies from rapid operation, as well as the very desirable uniformity of case produced. Speed of rotation of the retort can be varied between such wide limits that the work need not be dented or disfigured.

This furnace may also be used for hardening operations, and has successfully nitrided steel bars of such dimensions as to require a furnace chamber of extreme length with small diameter.



The Retort Tilts Forward, Facilitating Charging and Discharging. Three zones of control secure an even temperature throughout the retort

"Price Recession Has Run Its Course"

Speakers at Convention of National Association of Purchasing Agents Believe Bottom at Hand

COMMODITY prices and their trends, methods of purchasing, and the drift of business were outstanding subjects of discussion at the fifteenth annual international convention of the National Association of Purchasing Agents, held June 16 to 19 at the Stevens Hotel, Chicago. This meeting, with which was incorporated an exhibit, was attended by representatives of purchasing organizations in France, England and Mexico, as well as more than 100 Canadian members of the association. Establishment of a national clearing house for reports and findings of scientific and engineering groups in the aviation industry and formation of a central information bureau for data regarding purchasing and supplies were advocated.

New Officers Elected

The 1931 convention will be held at Toronto, Ont. Officers elected for the coming year were: Joseph E. Mills, commissioner of purchases, City of Detroit, president; John R. Whitehead, Fairbanks, Morse & Co., Chicago, vice-president at large; and also the following district vice-presidents: William H. Jackson, Axelson Aircraft Engine Co., Los Angeles,; G. A. Thompson, Empire Companies, Bartlesville, Okla.; William Grossmann, A. Leschen & Sons Rope Co., St. Louis; Harry C. Bradford, Rex Paper Co., Kalamazoo, Mich.; D. M. d'Albenas, Northern Electric Co., Montreal, Que.; F. H. MacKnight, Westinghouse Air Brake Co., Wilmerding, Pa.; J. E. Shelton, city purchasing agent, Birmingham; E. H. Hawkins, E. I. du Pont de Nemours & Co., New York; L. P. Marshall, Standard Electric Time Co., Springfield, Mass.

Bottom of Price Decline Near

A more liberal buying policy than the rigid hand-to-mouth basis on which American industry has been operating is foreseen by J. R. Whitehead, Fairbanks, Morse & Co., president of the National Association of Purchasing Agents. The rate at which prices have been declining has gradually decreased, indicating that the bottom has been reached or soon will be. When this point is reached it may be expected that the pressure toward short term buying will be relieved somewhat and a more liberal policy will be in order.

Expects Upturn in August

Business is scheduled for an upturn in August, after the dull month of July, but the improvement may be delayed until December, Alvan T. Simonds, economist and president of Simonds Saw & Steel Co., predicted. Decreasing money rates since last November indicate, with other factors, the beginning of another three-year cycle of advance in all lines, and a long cycle of advance over a 10-year period, with brief setbacks at the end of each three years. These "swings" he described as the normal orbits of business.

The need now to insure better business is training in economics and the theory of business, together with a knowledge that the days of "hunch and bunk" in forecasting business are about over. The business executive of today must be trained to think and to realize that the successful enterprises are going to be those that are based on the application of the right theory.

There is nothing to indicate a "general downward trend" in commodity price, Dr. H. Parker Willis, editor, *Journal of Commerce* and professor of banking, Columbia University, told members of the association. Commodity prices now average about 6 per cent below the 1926 normal, but the general price level has been lowered not by a general recession, but by marked declines in a limited number of commodity groups. Declines have come mainly in raw materials, and in some lines of manufactured goods where there were special cases of "overproduction" to meet the demands of artificially stimulated markets.

Price Recession Has Run Its Course

On the whole, price reductions are hopeful rather than a discouraging symptom, from the long range business point of view. Those industries which have overstocks of materials must necessarily submit to inventory losses, but, having done so, will have laid the foundation for prosperous conditions on a basis of cheap raw material. On the other hand, those businesses which are engaged in the production of the materials themselves find it difficult to maintain profits or dividends in the face of a shrinking price level.

Perhaps the most encouraging factor from the general business standpoint is the circumstance that in a number of commodity fields the price recession already has run its course without being regarded as more than a business problem peculiar to a given industry.

Proposes Study of Alloy Steel Scrap

E. G. Howell, Chicago, Tells Purchasing Agents Cooperative Effort Is Needed to Avoid Chaos

THE proper segregation and classification of alloy steel scrap by producers was urged by E. G. Howell of Chicago, chairman of the research committee of the Institute of Scrap Iron and Steel, Inc., at a meeting of the iron and steel committee of the National Association of Purchasing Agents, June 18, in Chicago. Because of the complications arising out of the increasing production of alloy steel, Mr. Howell recommended that the national association undertake a study of the problem in cooperation with the scrap institute. This recommendation was in conformity with a resolution adopted by the annual convention of the Institute of Scrap Iron and Steel last March in Chicago.

To Review Specifications

Mr. Howell also recommended that specifications of scrap be reviewed. He called attention to the specifications for heavy melting steel, which provide for billets, blooms, knuckles, coil springs, etc. "Is there anyone present who wishes to sell me a tonnage of billets, blooms, knuckles or coil springs at the price of heavy melting steel, or, let us put it the other way and ask the steel mill purchasing agents present how much tonnage of these grades they receive as heavy melting steel? It is fair to believe that they do not receive very much in view of the market prices for these grades, which rule from $1 to $7 a ton higher than melting steel.

"Since heavy melting steel represents the greatest tonnage of all scrap grades, why not get down to cases and actually state what will be accepted as heavy melting steel, instead of what the mill would like to have shipped, but is not shipped because it is economically impossible."

As part of a program of cooperation between the two associations, Mr. Howell also recommended the establishment of an arbitration machinery between producers of scrap and scrap iron dealers through the two associations.

Chaos Caused by Alloy Steel Scrap

With reference to alloy steel scrap, Mr. Howell said:

"Judging from the present research, patent applications, and investigations being made with all manner and kinds of metals being alloyed with carbon steels, it appears that civilization is about to enter the alloy and stainless steel age.

"The scrap business has been constantly working in the dark, more or less by rule of thumb. The producers, on one side, prepare their material according to their own ideas, and the consumers are generally accepting that material under archaic specifications. Therefore, the success or failure of the scrap man depends upon knowing what the mill 'will take.'

"To this general chaos is now added alloy steel scrap. On Feb. 4,

1926, a scrap classification was adopted by the Bureau of Standards and revised on Jan. 18, 1927. The work by the general conference is to be highly commended. However, as a precautionary measure, a joker was inserted, reading:

"'Alloy steel scrap may be excluded from these specifications by mutual agreement between buyer and seller.'

"This was attached to five out of eight classes of scrap for use in blast furnaces. Of the 26 classes of scrap for use in basic open-hearth furnaces, 13, or one-half (if you include silicon restrictions), can bar alloy scrap. These two groups of consumers represent over 80 per cent of the scrap moving in commerce.

"During 1928, when 51,544,190 gross tons of all kinds of steel were produced, 3,214,909 tons, or 6.2 per cent, was alloy steel, according to the data of the American Iron and Steel Institute. Therefore, the precautionary wording of the Bureau of Standards classification is in a sense a prophecy. Up to now, with the exception of the malleable foundry industry, we have not had much trouble with alloys. But the scrap ferrous metal of this country will become rapidly more impregnated with chromium, nickel, molybdenum, vanadium, and manganese (I purposely leave out silicon because that element has been very definitely recognized and segregated)."

Must Be Segregated at Source

"Many alloys, as you know, are very expensive as raw materials. Chromium, for instance, is worth from 6c. to 12c. a lb. When, however, it is present in steel scrap and the amount is unknown it can cause an immense amount of trouble in the new steel made from this scrap.

"We must, therefore, ask for the cooperation of the producers of scrap. After the identity of a bar end, turning or casting has been lost, there is no way to determine its contents other than by analysis. Therefore, the scrap containing alloys must be segregated immediately and kept separate until consumed. Toward this end we approach the National Association of Purchasing Agents to undertake a prompt study, the objective of which will be that a large percentage of alloys may be segregated at the point of scrap production."

Assails Direct Dealing in Scrap

"Producers of scrap who tie up their production direct with consumers by means of reciprocal arrangements will ultimately work against their best interests," declared Benjamin Schwartz, director general of the Institute of Scrap Iron and Steel, in an address at the same meeting.

"Trade paper quotations, which form the basis for many of these reciprocal contracts, are made as the result of willingness and activity of the scrap iron dealer to buy and sell in the open market. The elimination of the dealer as a factor in the market, the abolishing of the present open market facilities or the disruption of the machinery of the scrap industry, which will inevitably result from the growth of direct dealing, will prove costly to the stability of the steel industry and will bring about a condition where the producer will get for his scrap what the consumer desires to pay for it in an artificial market.

"The best interests and the greatest financial return for producers are in an open scrap market, where the law of supply and demand is the only rule, and where a strong national institute is prepared to back up the performance of contracts by the scrap industry.

"The service of the scrap industry is of inestimable value to steel consumers, because it provides price insurance on large tonnages and a reduction in the scrap inventory which the consumer would normally be compelled to carry, with its resultant drain on the financial structure of the corporation. This machinery, which employs 200,000 people for the service of the steel industry, is sensitive to the law of supply and demand. If allowed to function, this machinery will supply a continuous flow of scrap to serve as a cheapener in steel manufacture. If the development of direct dealing is encouraged, the example set by larger steel companies will compel a great number of other consumers to follow their lead and to duplicate the machinery of the scrap iron industry, with grave doubt as to whether they will be able to do so as cheaply as the scrap iron dealers."

Hold Industrial Relations Conference in August

The annual conference on industrial relations, held under the auspices of a committee from industry and the industrial department of the Young Men's Christian Association, is scheduled for Aug. 27-31, at Silver Bay, Lake George, N. Y. The conference was instituted about 12 years ago for the benefit of those interested in industrial relations. Arthur H. Young, Industrial Relations Counselors, Inc., New York, is chairman of the conference, and E. H. T. Foster, 347 Madison Avenue, New York, is executive secretary.

The program for this year's conference is to be built around the theme: Industry's stake in a balanced progress—material, cultural and spiritual.

Larger Heating Pipes for Railroad Cars

ATLANTIC CITY, N. J., June 24.—All head-end or non-passenger carrying cars used in passenger trains must be equipped by Oct. 1, 1931, with metallic steam connections of a larger size than at present between cars for the transmission of steam for heating purposes. After Jan. 1, 1933, all passenger cars must be so equipped.

Recommendations to this end were adopted here at the eleventh annual convention of the Mechanical Division of the American Railway Association. The plan had been under consideration for some time.

New specifications for draft gears were also adopted. These are intended to give greater protection to cars and their contents from damage and thereby bring about reduction in claims growing out of loss and damage to freight in transit. The specifications, which are designed to limit any future application of draft gears to certain approved types, result from extensive tests at Purdue University. It is said, however, that nothing in the specifications will prevent development of new and improved draft gears.

The convention recommended adoption of a new car coupler which is said to be stronger and operate more easily than the one now in use. While the coupler is somewhat different in design from the ones now in use, it is so built as to make it interchangeable, which will permit its gradual installation on all cars.

Spang, Chalfant & Co. and National Supply to Merge

Negotiations are being completed for a merger of Spang, Chalfant & Co., Inc., Pittsburgh, manufacturer of steel pipe, and the National Supply Co., New York, maker and distributer of oil well supplies and equipment. Details of the consolidation are expected to be made public before the end of the week. Total assets of the combined companies are in excess of $80,000,000.

Spang, Chalfant & Co., Inc., which two years ago absorbed the Standard Seamless Tube Co., Pittsburgh, is one of the oldest pipe makers in the United States, its Etna, Pa., plant having been started in 1828. At this plant lapweld and buttweld material is made, while a mill at Ambridge, Pa., manufactures seamless tubing. The combined plants have an annual capacity of 600,000 tons. The company also owns the controlling interest in the Oil Well Supply Co., Pittsburgh, products of which are similar to that of the National Supply Co.

The National Supply Co. operates plants at Toledo, Dayton and Springfield, Ohio; Philadelphia and Carnegie, Pa., and Torrance, Cal. It maintains more than 100 stores and warehouses for the distribution of oil country goods and has also handled the distribution of pipe for large steel companies.

▲▲▲ PERSONALS ▲▲▲

CHARLES L. WOOD, general manager of sales, Carnegie Steel Co., has been elected a vice-president of the company. He will continue in general charge of sales. Mr. Wood, who has been active in the steel business since

Charles L. Wood

1898, was made general manager of sales in November, 1925, and previously for seven years had been assistant general manager of sales in charge of the bar, hoop and band bureau. Mr. Wood was manager of the order department of the American Steel Hoop Co. when that company was taken over by the Carnegie Steel Co. in the formation of the United States Steel Corporation. He then was transferred to the sales department of the Carnegie company, and later became aid to WILLIAM G. CLYDE, then assistant general manager of sales.

—

WILLIAM BROWN of the machine tool firm of Wilson-Brown, Inc., New York, sailed last Saturday for Scotland, where he will spend a few weeks.

—

CUMMINGS C. CHESNEY, vice-president in charge of manufacturing, General Electric Co., and formerly manager of the company's Pittsfield, Mass., plant, has resigned as chairman of the manufacturing committee, effective July 1. He plans to make an extended tour of Europe and while there will visit General Electric plants. He has been with the company for more than 42 years. Mr. Chesney will be succeeded as chairman of the manufacturing committee by W. R. BURROWS, Schenectady, also a vice-president, who has served with Mr. Chesney as a manufacturing official since May 25, 1927, and who has been connected with the electrical industry since 1894, first with the Thomson-Houston Electric Co., Lynn., Mass., which was later absorbed by the General Electric Co.

—

J. L. REIBER has been appointed general sales manager for the St. Louis Gas & Coke Corporation, Granite City, with headquarters in Laclede Gas Light Building, St. Louis. He will have charge of sales of pig iron and all by-products. He began his business career as a salesman for the Carnegie Steel Co. at Pittsburgh in 1908 and after 11 years with that company he went to Philadelphia in 1919 to be sales manager for Rainey-Wood Coke Co. In 1925 he was made vice-president in charge of sales for W. J. Rainey Co., with headquarters at New York, holding as well the preceding position. In 1927, he went with the A. J. Davis Co., coal operators, Pittsburgh, as manager of sales, resigning on May 1 to become connected with the St. Louis Gas & Coke Corporation, of which he was made general sales manager on June 19.

—

FRANK DUSTAN, of the engineering department of the Putnam Machine Works of Manning, Maxwell & Moore,

Frank Dustan

Inc., New York, has been appointed chief engineer of the Putnam works. He received his schooling in Canada, followed by six years' training with the General Electric Co. at Schenectady. Later Mr. Dustan became associated with the Nova Scotia Steel & Coal Co. In 1919 he joined the Manning, Maxwell & Moore organization as a designer and later became assistant chief draftsman and sales engineer, specializing in railroad and steel mill machinery.

J. R. SHEPPARD, who has had over 16 years' experience in hydraulic and plate-working machinery requirements, has been appointed chief engineer of the Lake Erie Engineering Corporation, Buffalo. F. C. WALDOW,

J. R. Sheppard

formerly of the H. G. Trout Co., Buffalo, has been added to the foundry division of the Lake Erie company as consultant in problems and requirements pertaining to gray iron, semi-steel or ferroalloy castings.

—

WILLIAM MONROE WHITE, manager and chief engineer of the hydraulic department, Allis-Chalmers Mfg. Co., was honored by Tulane University, New Orleans, his alma mater, with the honorary degree of doctor of science at the recent annual commencement exercises.

—

W. W. PEACOCK has joined the machine tool department of Joseph T. Ryerson & Son, Inc., Grant Building, Pittsburgh. He was formerly associated with the Niles Tool Works and Motch & Merryweather Machinery Co., in the Pittsburgh offices of those companies.

—

LLOYD RAYMOND SMITH, president and general manager of the A. O. Smith Corporation, Milwaukee, was the recipient of the honorary degree of doctor of science at the annual commencement exercises of the University of Wisconsin at Madison on June 23. He is a graduate of the mechanical engineering department of the College of Engineering of the university.

—

WILLIAM D. BLISS, who has been president of Bliss Brothers Tool & Die Co. since his retirement from the

faculty of the College of Engineering, Marquette University, Milwaukee, two years ago, has accepted reappointment to the faculty, and will take charge of the chemical engineering department in September. He introduced the cooperative plan of engineering education at Marquette University in 1919, when he enlisted the interest of sixteen Milwaukee industries in part-time employment of students in the shops. At present there are forty concerns cooperating with the university in the plan and authorities proclaim the system an outstanding success.

—

JOHN E. JONES has been appointed Commissioner of Industries of the Welland County Ship Canal Indus-

John E. Jones

trial Area Commission, with headquarters at Welland, Ontario. L. B. SPENCER is chairman of the commission. Mr. Jones is a native of Canada and a graduate of Toronto University, in mechanical engineering. For many years he has been connected with manufacturing plants in various parts of the United States, both in engineering and management capacity. He served for two or three years, shortly after leaving college, in the engineering department of the Carnegie Steel Co., Pittsburgh.

—

ALBERT G. ZIMA, until recently metallurgical engineer of the Western Crucible Steel Castings Co., Minneapolis, has become identified with the development and research department of the International Nickel Co., Inc., New York, specializing in steel castings.

—

H. W. PETTY, who has been identified with the Detroit office of the Wagner Electric Corporation, St. Louis, has been appointed sales manager of the Pittsburgh territory, with office in Pittsburgh.

—

JOHN G. BENEDICT, treasurer and general manager of the Landis Machine Co., Waynesboro, Pa., has been elected a trustee of Pennsylvania State College, State College, Pa.

—

LOUIS P. WILLSEA, president, Willsea Works, foundry and machine shop, Rochester, has been elected chairman of the Rochester section of the American Society of Mechanical Engineers.

—

STEWART N. CLARKSON has resigned as assistant director of the National Electrical Manufacturers Association and has established offices at 522 Fifth Avenue, New York, to render trade association service to a few groups of competitive manufacturers.

—

R. L. DAVIS, engineer in charge of radio development at the East Pittsburgh plant of the Westinghouse Electric & Mfg. Co., has been named manager radio engineering department of the company at Chicopee Falls, Mass., plant. He has been succeeded at East Pittsburgh by V. E. TROUANT.

—

JOHN A. RENDLE of Toledo, Ohio, has been reelected president of the Sterlite Foundry & Mfg. Co., Auburn, Ind. Other officers elected were RICHARD J. SCHWEITZER, Chicago, vice-president, and A. L. KUHLMAN of Auburn, general manager, secretary and treasurer.

Merged Foundry Companies Elect Officers

Albert Pack, formerly chairman of the board of the Hubbard Steel Foundry Co., East Chicago, Ind., has been elected chairman of the board of the newly formed Continental Roll & Steel Foundry Co., which has resulted from the consolidation of the Hubbard Steel Foundry Co., the Duquesne Steel Foundry Co., Pittsburgh, and the Wheeling Mold & Foundry Co., Wheeling, W. Va. Other officers elected are: J. T. Osler, formerly president of the Hubbard Steel Foundry Co., president; Donald C. Bakewell, formerly president of Duquesne Steel Foundry Co., vice-president; Herbert E. Field, formerly president of Wheeling Mold & Foundry Co., vice-president; William E. Trautman, formerly vice-president, Duquesne Steel Foundry Co., vice-president; W. H. Seaman, formerly vice-president of Hubbard Steel Foundry Co., vice-president, and D. R. Wahlberg, secretary-treasurer.

The directorate includes Harold Beacom, of Winston, Strawn & Shaw; D. A. Burt, chairman of the executive committee, Wheeling Mold & Foundry Co.; Andrew M. Scott, president of Cochran, Scott & Co., Chicago; J. J. Shinners, vice-president, H. M. Byllesby & Co., and Howard Whitehouse, vice-president, Continental Illinois Co.

Shipyard Employment Gains with New Work

WASHINGTON, June 24.—The total ship construction and ship improvement programs which have been undertaken since the Jones-White Merchant Marine Act went into effect amount to about $125,000,000 in cost, according to the Shipping Board. The many pending applications for construction loans and replacements required under ocean mail contracts, it is estimated, will probably swell this total to about $300,000,000 during the current five-year period.

To show the effect on employment in the different shipyards arising from the construction of vessels through the aid of loans from the Board, the Board said that it has received statements from four American shipbuilding companies which reported an aggregate of 19,812 employees on May 1, 1930, as compared with 16,349 on July 1, 1929, a gain of approximately 21 per cent. These figures do not take into consideration the further increases in number employed at the New York Shipbuilding Co., at whose yards two $11,000,000 ships are about to be built for the United States Lines, and also at the yards of the Bethlehem Shipbuilding Corporation and of the Newport News Shipbuilding & Dry Dock Co., each of which has recently been awarded contracts for constructing three $3,425,000 vessels. The reports were received from the three shipbuilding companies named and also from the Sun Shipbuilding Co.

WARNER SEELY, as announced in THE IRON AGE of June 12, has been elected president of the Cleveland Engineering Society. He is secretary of the Warner & Swasey Co.

Directors of Foote Brothers Gear & Machine Co. have declared a stock dividend of 2 per cent on the common shares in lieu of the regular quarterly payment of 30c. in cash. The regular quarterly dividend of $1.75 on preferred stock was declared.

E. P. Thomas Sees Dawn of Better Day

Vice-President of United States Steel Corporation Addresses Sheet Manufacturers Hopefully

E. P. THOMAS, vice-president, United States Steel Corporation, in addressing the National Association of Flat Rolled Steel Manufacturers at its convention last week at White Sulphur Springs, W. Va., said in part:

"It is evident that substantial progress is being made, although none too soon, through the work of your organization and of ours in trade research into flat rolled sheet and strip uses; but in some respects it may seem to you that the surface has merely been scratched in some of the important possibilities.

"The trade research committees of our subsidiary manufacturing companies, during the past year, have been reorganized and their work will be complementary to yours, although necessarily embracing all of the products of the Steel Corporation.

"Our Trade Research Bureau in Pittsburgh, with C. O. Hadly in charge, will assist in coordinating the functions not only of the trade research committees of our several companies, but of other committees of our companies collaborating in problems of research, metallurgy and advertising applicable to promotion of new and increased usage of steel.

Will Cooperate to Expand Trade of Customers

"We therefore feel we have appropriate machinery of cooperation with executives and members of your association in problems of mutual interest in the service of joint customers to expand their trade activities.

"Mr. Charls referred to large increase in capacity without sufficient regard to normal expansion of consumption commensurate with growing population and commercial development.

"Perhaps the expansion and abnormal prosperity of last year created a mirage of potentialities which it will take some years to translate into actualities. Nevertheless, this surplus reservoir of capacity over demand presents an intriguing challenge to engage, through our best efforts, that capacity and maintain and increase employment of our labor. It sets up a definite inspiration for more extensive and complete collaboration with our customers in assisting them to find new and expanded use for their product. It creates the implication that the numerous associations which exist among our customers for the protection and expansion of their own interests have important work to do in conjunction with your association and the Trade Research Bureau of our subsidiary manufacturing companies. It points definitely to the necessity of combating the claims of those associations whose chief purpose is to advance substitutes for steel.

"As Mr. Farrell pointed out last year, in the development and improvement of our processes to offer to consumers a superior product, it is important that our claims should be conservative and well authenticated and afford no opportunity for refutation by competitors or those offering substitutes.

"Our campaign therefore must be one of intensive support to our customers' efforts to expand secondary and consuming demand. The welcome which such manufacturers of highly finished products and those of popular consumption will gi e to effective efforts to promote their interests and the increased use of their goods should subordinate the question of prices of the primary material to mutual interests of expanding usage and distribution.

Concessions Do Not Promote Increased Consumption

"Certain it is that no permanently increased volume of business nor increased demand from buyers is likely to result from temporary concessions in price, which, even if passed on to the ultimate consumer, are usually of negligible effect in promoting increased consumption.

"Certainly it has become painfully apparent that the effort on the part of any manufacturer to run full when business conditions permit, we will say, only some 75 per cent operation can be attended only by disturbing results.

"There are many bright spots in the horizon. It was inevitable that disturbed conditions would follow the debacle of last autumn, but the experience derived from this lesson and the substantial work which has been done during the past six months in promoting stability and confidence may well lead us to the belief that the dawn of a better day is approaching and that from these developments there is in process a renaissance of better business, better ethics, better methods and better profits."

Basic Bessemer Steel Barred by British Specification

WASHINGTON, June 24.—The revision of the British Engineering Association's standard specification (referred to in THE IRON AGE, June 12, page 1796) has given satisfaction to British steel makers, since for the first time it excludes basic Bessemer steel, which has hitherto been included, says a report received from the office of the American consul in London. Not for many years has any steel been made in Britain by the basic Bessemer process, the report points out. The uncertain quality of the product was assigned as the reason for eliminating this steel from the standard specification.

"It continues to be the principal method of manufacture employed in France and Belgium, however," the report adds, and it is stated that upward of 90 per cent of the steel now being imported into England is produced by the basic Bessemer process."

Work Started on Ford Plant in Buffalo

Work in preparation for the construction of the first of the new Ford Motor Co. plants in Buffalo is progressing in the outer harbor. A contract for filling in and cribbing on a site now under water, about 30 acres in extent, has been let to the Great Lakes Dredge & Dock Co. On this site will be built an assembly plant for Ford cars. It will cost $1,000,000 and will afford employment for approximately 3500 men. Plans are also going through for the establishment of a reduction plant to scrap old cars and reclaim metal.

Newport News Low Bidder on Two New Ships

WASHINGTON, June 24.—The Newport News Shipbuilding & Dry Dock Co., Newport News, Va., has submitted a bid of $6,429,000 for the construction of two combination passenger and cargo vessels for the Eastern Steamship Co. The Newport News bid was the lowest of six. The Eastern Steamship Co. has made application to the Shipping Board for a construction loan on the basis of the bids received.

Marshall & Huschart Co., of Indiana

Omar S. Hunt, president, Marshall & Huschart Co. of Indiana, was mistakenly identified with the Chicago company of that name in a report of the meeting of the Associated Machine Tool Dealers at Granville, Ohio, published in THE IRON AGE of June 12, page 1775.

Obituary

DOUGLAS C. HARVEY, president Reynolds Wire Co., Dixon, Ill., died on June 17 at New Haven, Conn., while attending a class reunion at Yale University. He was graduated from the Sheffield Scientific School of that university in 1905, and was 46 years old.

—

JOHN P. LUITINK, one of the founders and vice-president of Luitink & Sons Mfg. Co., Milwaukee, metal stampings, died on June 14 after a brief illness, aged 67 years.

—

ALEXANDER L. GREENABAUM, vice-president, O. F. Jordan Co., maker of spreaders and ditchers, East Chicago, Ind., died on June 4 at his home in Chicago after a long illness. He was 50 years old.

W. W. MACON
Editor

THE IRON AGE

A. I. FINDLEY
Editor Emeritus

ESTABLISHED 1855

The Economic Status

THE renewed decline of the stock market this month is a reflection of a profound pessimism that is based on a fuller appreciation of the gravity of the economic depression which we know now to be world wide. This pessimism may, however, be overdone, just as optimism continued last year long after the crumbling was in progress. It is reasonable to assume that natural corrections have already been some time in process.

We may see points of similarity between the economic setback that began in 1920 and that which began in 1929, both emanating from an overstocking of goods which necessitated a checking of production pending natural absorption. Yet we discern important differences. Previous to the middle of 1920 Europe had been buying from us on credits extended by us and had not begun to pay her debts, whereas in 1929 the situation was quite otherwise. Furthermore, since 1922 there have been important changes in methods of production.

Owing to the unbalance in the supply of many goods commodity prices have generally fallen and a composite of them is now low, but the index of the general price level, which takes into account rent and services of many kinds, has not fallen materially, while the index number of wage rates in some important industries, e.g., in building, continues very high, this unbalance in itself being detrimental to commodity prices.

In the existing depression, however, there is an entirely new factor originating from the political disturbance in China and the policy of the Indian Government in respect to silver. The decline in the price of silver from 69c. an oz. in 1925 to 53c. in 1929 and to about 33c. at the present time has been an adversity of major character. The mobile wealth of the Orient has been practically cut to half and this has had natural repercussions in the Occident. As to recovery from this reverse no one can be optimistic. Except for this serious handicap the unbalances between consumption and production will be corrected as they were after the depression of 1920-22, perhaps more quickly, perhaps more slowly, as to which no one knows enough to prophesy.

Notwithstanding our elaborate system of economic surveys and forecasting, the extent of the present depression took us by surprise. This rather supports the view that great economic movements do not proceed by rules or cycles but rather are they inspired by human nature, and that the purpose of economic surveys is not prophecy but rather guidance as to industrial behavior.

The most disturbing thing in respect to development of our economic surveys is the failure of industries to govern themselves accordingly. In more than one industry the evidence of overproduction was clear last year but selfish reasons or simple inability to interpret prevented proper behavior.

Withal, as already stated, there are sound grounds for confidence. Most important is the evidence that we have had right along that real consumption in this country has not been materially curtailed. It has been mainly a matter of the stocks between producer and consumer. Population steadily increases. Important new building projects have been instituted. Credit conditions are easy. The inauguration of the International Bank, the adjustment of German affairs, and the American participation in the loan is a constructive step. Even the low commodity prices that are cruel to exporting countries are blessings to importing countries and thus does readjustment start.

Room for Residential Building

THERE would be a very large field for residential building if costs were right, which they are not. We refer not to large skeleton steel construction apartments, but to single dwelling houses, duplexes and small apartment houses. For quite a while mortgage money for such buildings was hard to secure and for a time after money became easy in general it was not so readily available for these small mortgages. Now, with qualifications, it is, according to a survey by Fred Gardner published in the New York *Evening Post*.

Ultimately this will stimulate building, but not immediately. Charles G. Edwards, head of the Real Estate Securities Exchange, just returned from a trip to the Pacific Coast and other sections, is quoted with respect to demand for building: "Residential construction, for instance, needs cheaper material and building costs in general before it can revive on any appreciable scale."

It would be interesting to have complete statistics of the total dwelling space in the United States classified according to age, but no actual statistics are needed to enable one to form a positive opinion that there is a large percentage that has outlived its proper usefulness. If building costs were what they should be in relation to costs of many manufactured things, automobiles as a conspicuous case, literally millions of dwellings would be found ripe for destruction, to be replaced by modernly equipped, comfortable and sanitary structures.

Some faint recollection remains of surveys and estimates made just after the war to the effect that there was a great housing shortage and that there

would be much building for many years should costs be made right. In the confusion of thought at the time it was urged that those concerned moderate their views, get costs down, and be rewarded by having much work. Naturally nothing of the sort was done, for who is going to sell something cheap when it is scarce?

While there are no complete statistics, there is ample information to create a definite idea. Recently the Bureau of Labor Statistics issued its annual report showing for last year the number of families provided with dwelling quarters in 257 cities having a population of 25,000 and over. In the nine years of these statistics the total number of families was 3,490,848, in single dwellings, duplexes and apartments. There is no information to relate the population of these cities to total population, but at 3½ persons to the family the number of persons provided with new quarters would be a little over 12,000,000, while the population of the whole country increased a trifle over 14,000,000 in the same period. It would certainly appear that there was not enough building to make up for mere aging of old structures, whereas with the rapid increase in conveniences houses are made obsolete much more rapidly than in the old days.

If mortgage money for dwellings is not pressing on the market it is because those who have it do not approve of present building costs, and those who would supply the equity are of the same mind. Compared with 1913 one gets much more than a dollar's worth of automobile and much less than a dollar's worth in a house. The manufacturer of automobiles or anything else watches his material and labor costs closely, his future depending on it. With a dwelling the cost is simply passed to a new person each time who cannot make a contest but must take things as he finds them.

Machinery and Unemployment

WE continue to hear a good deal about technological unemployment. During the recent years of "boom," when jobs were plentiful, the term was unknown to most people. The introduction of improved machinery does displace labor, temporarily. But it has never taken place, and probably never will, at a rate to cause a depression. We must look for the causes of depression elsewhere; in speculation, extravagance and mismanagement.

The displacement of labor through the introduction of an improved machine is a tangible fact. The beneficial effect of that improved machine on future employment, while real, is intangible, and not immediate. Hence we see what appears to be the evil of the machine and do not see its good, from the employment standpoint. However, a 75-year industrial record, as pointed out editorially in THE IRON AGE of June 12, shows that improved machinery during that period has doubled the employment ratio, to say nothing of what it has done for the average standard of living.

Less than a century ago, in the British coal mines, women worked 14 hours a day crawling on hands and knees through tunnels 24 inches high, chained to coal cars which they dragged from the mine workings to the tipple. Little children from eight to twelve years old climbed long ladders carrying 50-pound sacks of coal on their backs. Improved machinery has done away with this sort of human or inhuman slavery. And who will say that England today, even with unemployment and doles, is not far better off than in those "good old days" before the machine age?

Our own automobile industry has been cited as an example of labor displacement through improved machinery. It is said that less labor is required (even under normal conditions) to produce our motor cars today than was required a few years ago for a smaller output. But if true, this is but one side of the picture. And against that we must set down what the motor car, made possible and popular through this improved machinery, has done to create jobs, outside of the automobile industry. How many truck drivers and private chauffeurs and taxi-drivers has it put to work? How much suburban and country residence and business building has it been the means of making possible? How many oil refineries has it put to work? How many jobs has it made in public garages and repair shops? The machine may displace labor—the product of the machine creates new opportunities for it.

It is an old story, this charge against the machine, although today it has the newer name—technological unemployment. More than half a century ago, before the days even of the electric motor, men were afraid that overproduction and unemployment were just around the corner. Read, as an illustration of this, the following editorial from THE IRON AGE of April 11, 1872:

> On every side we see hand labor supplemented or superseded by machinery and every year a larger proportion of those held in bondage are emancipated from their servitude and elevated to the performance of higher duties. The emancipation of labor thus effected has been beneficial to labor itself and is no longer open to question. Wherever mechanism has suspended hand labor, those whom it has driven from their old occupations have been quickly absorbed into new ones more remunerative and more elevating in their influence upon mind and body than those in which hand labor has been rendered unprofitable; or else mechanism has so cheapened and stimulated production as to require an increase of labor.
>
> The spinning jenny and loom have driven no one from the business of cotton manufacture. On the contrary there is a constantly increasing demand for the labor of both men and women in this important industry which but for machinery would never have attained anything like its present vast proportions.
>
> A single example of this sort will suffice. A few years ago the manufacture of mantels and other articles in marble was an important industry in certain parts of New England, and many thousand men were employed in cutting and carving the slabs by hand. The process was costly, and hand cut mantels were so expensive that the demand for them was necessarily limited. Not long since a machine was invented which cut marble in all required shapes and patterns cheaply and rapidly. To the introduction of this machine in the various marble yards the carvers and other workmen made a vigorous opposition. Their opposition was ineffectual, however, and the machine came into general use but with different results from those anticipated. The trade was revolutionized. Machine cut marbles were in enormous demand, and more men were needed to tend the machines and prepare the stone for cutting than had formerly been

employed in all branches of the business. So it is in every industry in which machinery is employed.

Nothing that stimulates and cheapens production injures life in any sense, and the more machinery a nation has in active operation the more fully and profitably is its labor, skilled and unskilled, employed; the more rapid its material progress toward the highest standard of civilization.

The last paragraph of that editorial is as timely and as true today as it was 58 years ago.

Consistent Automobile Production

THE view is entertained in some quarters that business has received a fresh setback of late, say in the last three months. Just how widespread is this view cannot be closely observed. The opposite view would be that business since Jan. 1 has been pursuing the natural course after what had occurred. It is therefore important to seek all possible measures that may show whether trade has been in normal swing, after allowance for seasonal variation. The point, of course, is whether there has been progressive recovery or a fresh backset, or neither.

In steel it has looked as if there was a fresh backset, but the appearance is somewhat deceptive, the impression arising from time rather than tonnage. Steel production increased rapidly to a peak in February and then declined quite slowly, the impression of decline being strong because the decline has lasted so long.

With the half year almost completed the best comparison would be by quarters, whereupon it is found that the average rate of steel production has been about 7 per cent lower this quarter than last. Last year was no criterion of seasonal variation and may be ignored, while previous years showed decreases from first to second quarter, 1926-7-8 averaging about 4 per cent decrease while 1925 showed about 17 per cent decrease, yet it turned out to be a good year, breaking the production record of 1917. One can hardly say at long range that steel has had a fresh backset. Rather it has merely failed to carry out a promise made for only a brief period, in January and February.

Four weeks ago we compared freight car loadings between the first nine and the second nine weeks of the year, showing that there was just a trifle less increase than usual, far less than enough to indicate that there was a retrogression, but enough to prove that there was nothing by way of progressive recovery.

Now we may make a comparison in the case of automobile production, using as basis for normal or average seasonal variation the average monthly production in the last six years. While last year was abnormal in seasonal variation in the second half, with its great slump, the monthly variations in the first half were in keeping with those of other years.

Comparing monthly production as officially reported for five months of this year with the six-year monthly averages, we find that each month showed a decrease, but the decreases were small, ranging from 6.9 per cent in March down to 1.1 per cent in April, the other three months of the five falling between. For the current month, however, there seems to be a larger decrease, over 10 per cent. A fair guess of car and truck production, United States and Canada, seems to be about 350,000, against 441,826 officially reported for May. As we wish to compare quarters an error for this month would not throw the total out materially. The comparison follows:

Automobile Production

	Six-Year Average	1930	Decrease, Per Cent
First quarter	1,127,441	1,070,293	5.1
Second quarter	1,334,170	1,258,918	5.6

Certainly a one-half per cent change is not enough to indicate a fresh backset, but the absolute failure of the second quarter to make a better comparison with the past than did the first quarter proves that there is no progressive recovery.

That there has been, say since April 1, a decided change in sentiment, or in the amount of hope for speedy recovery in business, is not denied, but the testimony of trade movements is that the fault lies rather with the early views than with actual underlying conditions. Apparently nothing has gone wrong but things have not moved in the desired direction as expected.

CORRESPONDENCE

Mechanization Pace Aggravates Employment Problem

To the Editor: In your recent editorial "The Myth of Technological Unemployment," you argue from the beginning of the modern machine age, which you put at about 80 years ago. And you show that in the past machines have doubled the rate of employment.

That may be so; but the increase of mechanization has become so accelerated of late that a great slackage of employment has resulted. In the less recent past men thrown out of work by the machines that were invented to take their places soon were absorbed in other lines, often in making the very machines which had displaced them; in before unthought of work made possible by invention and discovery; or because of increased purchasing power on the part of those operating the new machines. The United States had vast new areas to be developed, it was becoming a manufacturing nation disestablishing imports; its production of goods per capita expanded enormously, so that even while imports showed great growth they did not, in essentials, maintain their former pace.

But the situation has changed, a new condition has risen; the acceleration of consumption has slackened. Men thrown out of work by machinery are, and for some time have been, finding it increasingly difficult to locate new jobs; now this is truer than at any time since the advent of the machine age. It may be doubted, I think, if the absorption in the future into new industrial operations of those made idle by the more and more rapid introduction of automatic and semi-automatic machinery can be anywhere near as speedy and complete as it used to be, or as it should be for the sake of general prosperity.

Let me take one illustration from an industry allied to THE IRON AGE and of which I know: Twenty years ago the Mesabi range employed 22,000 men to mine much less ore than was produced in 1929 by 10,000 men. In 1916 St. Louis (Minn.) county mines employed 15,000 men in

The Week in Business

Drift of Current Financial and Economic Opinion

BUSINESS and productive activity are called "spotty and irregular." But while this persisting condition is strongly depressing, the Harvard Economic Society thinks that "pessimistic feeling and conflicting tendencies within business not infrequently mark the formative stage of recovery. . . . They do not alter our expectation of an early and substantial recovery in general business."

Yet, other observers are not slow in predicting a summer slump of greater than normal magnitude. Both *Annalist* and United Business Service have so sized up the situation. The former refers to commodity prices, down to "a new record post-war low"; an index of factory employment, at the lowest point since August, 1922, and "other records somewhat less emphatic."

Thinks Low Commodity Prices a Good Sign

But falling prices are not everywhere deplored. Dr. H. P. Willis told the National Association of Purchasing Agents that they are really a symptom of healing. "In a number of commodity fields, the price recession has already run its course without being regarded as more than a business problem peculiar to a given industry. . . . We may conclude," he said, "that what has happened during the past few years has been the establishment of an artificial system of prices."

That the cheerful sentiment in evidence earlier in the year has largely disappeared is the view of Alexander Hamilton Institute. Some are inclined to place the blame, at least in part, on the tariff legislation.

Overbuilding Blamed for Depression

Excessive plant capacity is charged, in some quarters, with much responsibility for present conditions. "When demand has been continuing at a high level over a considerable period," says National Industrial Conference Board, "there is a tendency to overbuild plant capacity. . . . In those industries where plant capacity is now capable of producing in excess of normal demand, there seems little reason for any further building for the sole purpose of stimulating business activity."

Building supply and demand is thus commented on by S. W. Straus & Co.: "Every month . . . with this restricted volume of construction means that improved real estate has been placed on a sounder basis. . . . It means a steady wiping out of surplus space wherever it exists, because increases in demand are constant through population growth, obsolescence, higher standards of living," etc. One publication has this week a headline reading: "Cold Storage Space Idle Now, But New Warehouses Keep Rising."

Decline Accompanied by Lower Living Costs

After resisting for a time the usual summer slackness, basic industrial activity, *Business Week* finds, "is declining more rapidly. General trade, still relatively nearer normal than production, continues to fall off. Commodity prices show little resistance to further decline."

Labor troubles have been slight; too much unemployment threatened. No May for 16 years had fewer strikes than last month, according to United Business Service. "We do not expect much of an increase in either employment or payrolls before fall," that organization says. "Strikes will continue below last year and the softening tendency in the cost-of-living index will probably run further."

iron mining and produced 30,782,000 tons of ore and 6,220,000 cu. yd. of stripping; last year with 8000 men it produced 35,680,000 tons of ore and 7,160,000 yds. of stripping. In other words 2200 tons of material was the man-year product of 1916, while 5000 tons was that of thirteen years later.

Every town on the Mesabi shows a smaller population than by the census of 1920. Into what industry have those men been absorbed? To a large extent they are unskilled laborers. If I understand the meaning of the phrase "technological unemployment" it is the displacement of human labor by machines, and covers unskilled labor as well as that more informed. The factory has not taken these unskilled laborers; the farm certainly has not, for it uses fewer men than then, although with a far larger output of food, so large indeed that we cannot eat it nor export it; the forests have not, they are in the same position as agriculture. The national road program has absorbed some of these men, but great numbers of them are yet unassimilated.

Standing on the edge of a great Mesabi pit the other day, the superintendent pointed to a track gang. "Last year we had 25 men in that gang," said he, "but in the winter we bought a locomotive crane, and now we have 12 men doing the work faster than the 25 did a year ago."

That, multiplied by similar instances all over the United States, and known to every executive and to the family of every worker, is the tragedy of unemployment.

In the building of that locomotive crane and in the supplying of materials therefor, men were employed at a better rate of pay than that of the track gang. But far from enough to neutralize the loss of half those men permanently.

DWIGHT E. WOODBRIDGE.

Duluth.

Impostor Is Operating in Illinois

To the Editor: Your representative, a man of medium height and stocky build, called on us yesterday or a day previous to the receipt of your invoice and informed us our subscription had expired and he had come to collect. We told him it was the first time in the period which we have taken the magazine that anyone had called on us to collect for the subscription. Also informed him to send us the invoice for the renewal and we would forward check for payment. He immediately got abusive and very insulting.

F. C. HEIDEN,
Treasurer, Victor Foundry Co.

Peoria, Ill.

Note: The man who called on Mr. Heiden is an impostor. THE IRON AGE subscribers in Illinois and nearby States are warned to be on their guard. If this man calls on you, please wire collect to the Reader Service Department, THE IRON AGE, 239 West Thirty-ninth Street, New York.

Iron and Steel Markets

Structural Inquiries Total 91,000 Tons

Construction Work and Pipe Line Projects Are Main Support of Industry as Seasonal Lull Becomes Pronounced— Further Price Reductions

SEASONAL influences, accentuated by current pessimism, obscure the outlook in the iron and steel trade. Summer shutdowns of two weeks or more by a number of large steel-consuming plants, notably in the Detroit district, coupled with the customary mid-year suspensions for inventory in virtually all lines of industry, make it clear that, temporarily at least, iron and steel demand will undergo further reduction.

On the other hand, heavy line pipe bookings and mounting requirements in structural steel remain encouraging factors, and an impending general business recovery is sensed by leaders of the steel industry who have passed through many cycles of trade expansion and contraction. They believe that curtailment of buying has been overdone, and they see signs of a reaction in the other direction in scattered evidences of more liberal purchases of various products.

Plans of the United States Steel Corporation to bring as much ore down the Lakes as in 1929 are interpreted as indicating its faith in the business prospects for the last half of the year. The scheduled blowing in of two blast furnaces by a large Pittsburgh independent early next month may point to similar confidence, although probably more largely influenced by pressure for line pipe deliveries.

Steel ingot production for the country at large has declined to 64 per cent from the 65 per cent rate of a week ago. Companies catering to the automobile trade are curtailing the most, while those having large capacities in pipe are holding their own or making slight gains. The Steel Corporation average, at 72 per cent, is three or four points higher than a fortnight ago.

Construction work continues to develop in increasing volume. New structural steel projects, at 91,000 tons, are the largest this year with the exception of two weeks ago, when they totaled 112,000 tons. A highway project in Jersey City and two sections of New York subway alone account for nearly 50,000 tons. More structural steel business is in prospect than at any time in the past year.

The country's capacity in line pipe is fully committed for six months. The Republic Steel Corporation has booked an additional order for 10,000 tons from the Missouri-Kansas Pipe Line Co. The Sun Oil Co. is in the market for 200 miles of 20-in. gas pipe and the Ajax Pipe Line Co. will soon buy against its inquiry for 300,000 tons. It is becoming difficult to find mills that can take orders for line pipe projects scheduled for completion this year.

Business in sheets and other light products has been adversely affected by the impending suspensions among automotive plants. The Ford Motor Co. has advised suppliers of material that its plant will be shut down from July 12 to July 28 and that it will discontinue receiving shipments of steel July 9. Demand for sheets from other sources, notably for roofing and other building purposes, shows some improvement.

Tin plate production, although undergoing a seasonal decline, is holding at the very satisfactory average of 75 per cent.

Railroad demand for steel, which has been declining steadily, is expected to pick up in a month or two. The Ensley rail mill was shut down last week and rail production at Chicago is now down to 50 per cent of capacity, but an active secondary rail buying movement is forecast. The Norfolk & Western has bought 40,000 tons of rails, placing 30,500 tons with the Carnegie Steel Co. and 9500 tons with the Bethlehem Steel Co. The Santa Fe has raised its inquiry from 40,000 tons to 60,000 tons.

Demand for many products is too spotty to give any indication of trend. Business in bars at Chicago is at the lowest point of the year, whereas a leading producer in another important center reports a substantial increase in bookings.

A similar situation exists in the pig iron market, with signs of improvement too scattered to be convincing. In the Chicago district a reduction of 50c. a ton brought out considerable buying. Pig iron prices also declined 50c. at St. Louis.

Weakness in steel prices has crystallized in a number of further open breaks in the market. Terne plate has been marked down by varying amounts—from 40c. a package for the 8-lb. coating to $1 for the 40-lb. coating. Wire nails are now rather commonly obtainable at $2.05 to $2.10 per keg, compared with the recent open market quotation of $2.15. Similarly, galvanized sheets range from 3.15c. to 3.20c. a lb., as against a recent minimum of 3.20c.

Concessions in bars, plates and shapes have brought these products back to a position of parity, with the market on all three ranging from 1.65c. to 1.75c. a lb., Pittsburgh. For some time the minimum open prices have been 1.75c. on bars and 1.70c. on shapes and plates.

Among the non-ferrous metals, zinc has declined to 4.32½c., East St. Louis, the lowest price since Sept. 20, 1921. Copper has receded to 11.50c., delivered Connecticut valley, or ¼c. lower than the quotation of a week ago. Tin has shown a slight recovery. At 30.75c., New York, it compares with 29.50c. seven days ago.

THE IRON AGE composite prices have receded to new low levels. Pig iron has declined 8c. to $17.42 a gross ton, and finished steel is off 58c. a net ton to 2.185c. a lb.

A Comparison of Prices

Market Prices at Date, and One Week, One Month and One Year Previous, Advances Over Past Week in Heavy Type, Declines in Italics

Pig Iron, Per Gross Ton:	June 24, 1930	June 17, 1930	May 27, 1930	June 25, 1929
No. 2 fdy., Philadelphia	$19.76	$19.76	$19.76	$21.76
No. 2, Valley furnace	18.50	18.50	18.50	18.50
No. 2 Southern, Cin'ti	16.69	16.69	16.69	18.69
No. 2, Birmingham	14.00	14.00	14.00	15.00
No. 2 foundry, Chicago*	*18.00*	18.50	19.00	20.00
Basic, del'd eastern Pa.	18.75	18.75	18.75	20.25
Basic, Valley furnace	18.50	18.50	18.50	18.50
Valley Bessemer, del'd P'gh.	20.76	20.76	20.76	20.76
Malleable, Chicago*	*18.00*	18.50	19.00	20.00
Malleable, Valley	19.00	19.00	19.00	19.00
L. S. charcoal, Chicago	27.04	27.04	27.04	27.04
Ferromanganese, furnace	94.00	94.00	94.00	105.00
Rails, Billets, etc., Per Gross Ton:				
Rails, heavy, at mill	$43.00	$43.00	$43.00	$43.00
Light rails at mill	36.00	36.00	36.00	36.00
Rerolling billets, Pittsburgh	31.00	31.00	31.00	34.00
Sheet bars, Pittsburgh	31.00	31.00	31.00	35.00
Slabs, Pittsburgh	31.00	31.00	31.00	35.00
Forging billets, Pittsburgh	36.00	36.00	37.00	39.00
Wire rods, Pittsburgh	36.00	36.00	36.00	42.00
	Cents	Cents	Cents	Cents
Skelp, grvd. steel, P'gh, lb.	1.70	1.70	1.70	1.85
Finished Steel,				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Bars, Pittsburgh	*1.65*	1.75	1.75	1.95
Bars, Chicago	*1.75*	1.85	1.85	2.05
Bars, Cleveland	1.75	1.75	1.75	1.95
Bars, New York	*1.98*	2.08	2.08	2.29
Tank plates, Pittsburgh	*1.65*	1.70	1.70	1.95
Tank plates, Chicago	*1.75*	1.80	1.80	2.05
Tank plates, New York	1.93	1.93	1.98	2.22½
Structural shapes, Pittsburgh	*1.65*	1.70	1.70	1.95
Structural shapes, Chicago	*1.75*	1.80	1.80	2.05
Structural shapes, New York	1.90½	1.90½	1.95½	2.19½
Cold-finished bars, Pittsburgh	2.10	2.10	2.10	2.30
Hot-rolled strips, Pittsburgh	*1.65*	1.70	1.70	1.90
Cold-rolled strips, Pittsburgh	2.45	2.45	2.45	2.75

*The average switching charge for delivery to foundries in the Chicago district is 61c. per ton.

Finished Steel,	June 24, 1930	June 17, 1930	May 27, 1930	June 25, 1929
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Sheets, black, No. 24, P'gh.	2.55	2.55	2.55	2.85
Sheets, black, No. 24, Chicago dist. mill	2.65	2.65	2.65	3.05
Sheets, galv., No. 24, P'gh.	*3.15*	3.20	3.20	3.60
Sheets, galv., No. 24, Chicago dist. mill	*3.25*	3.30	3.30	3.80
Sheets, blue, No. 13, P'gh.	2.15	2.15	2.15	2.35
Sheets, blue, No. 13, Chicago dist. mill	2.25	2.25	2.25	2.45
Wire nails, Pittsburgh	*2.05*	2.15	2.15	2.65
Wire nails, Chicago dist. mill	*2.15*	2.20	2.20	2.70
Plain wire, Pittsburgh	2.30	2.30	2.30	2.50
Plain wire, Chicago dist. mill	2.35	2.35	2.35	2.55
Barbed wire, galv., Pittsburgh	2.80	2.80	2.80	3.30
Barbed wire, galv., Chicago dist. mill	2.85	2.85	2.85	3.35
Tin plate, 100 lb. box, P'gh.	$5.25	$5.25	$5.25	$5.35
Old Material, Per Gross Ton:				
Heavy melting steel, P'gh.	$15.00	$15.00	$14.75	$18.25
Heavy melting steel, Phila.	12.50	12.50	13.00	16.00
Heavy melting steel, Ch'go.	12.00	12.00	12.25	14.75
Carwheels, Chicago	13.50	13.50	13.75	14.00
Carwheels, Philadelphia	14.50	14.50	14.50	16.00
No. 1 cast, Pittsburgh	14.25	14.25	14.25	15.50
No. 1 cast, Philadelphia	13.00	13.00	14.00	16.50
No. 1 cast, Ch'go (net ton)	*12.00*	12.50	12.75	14.50
No. 1 RR. wrot., Phila.	15.00	15.00	15.00	16.00
No. 1 RR. wrot., Ch'go (net)	10.00	10.00	11.00	13.50
Coke, Connellsville,				
Furnace coke, prompt	$2.50	$2.50	$2.50	$2.75
Foundry coke, prompt	3.50	3.50	3.50	3.75
Per Net Ton at Oven:				
Metals,				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Lake copper, New York	12.12½	12.12½	13.12½	18.12½
Electrolytic copper, refinery	**11.75**	11.50	12.75	17.75
Tin (Straits), New York	**30.75**	29.50	31.75	44.25
Zinc, East St. Louis	*4.37½*	4.45	4.62½	6.70
Zinc, New York	*4.67½*	4.80	4.97½	7.05
Lead, St. Louis	*5.15*	5.30	5.40	6.80
Lead, New York	*5.25*	5.40	5.50	7.00
Antimony (Asiatic), N. Y.	*7.00*	7.10	7.35	8.75

On export business there are frequent variations from the above prices. Also, in domestic business, there is at times a range of prices on various products, as shown in our market reports on other pages.

PITTSBURGH

Fresh Price Weakness Reduces Plates, Shapes, Bars, Nails and Galvanized Sheets

PITTSBURGH, June 24.—Steel mills in this and nearby districts are preparing for a month or more of marked inactivity. Sustained tapering of specifications in the last few weeks is being followed by complete hold-ups for fortnight periods in many large consuming plants, notably in the Detroit district. In that territory automotive parts makers are following the lead of the large motor car builders in closing down their plants for two weeks, and in other districts similar action is being taken. Suspensions are to be distributed over the entire month of July and early August, and loss of shipments to these consumers will seriously interfere with steel production. While steel companies will not be able to meet these conditions by similar complete suspension of activity, many individual units will not operate next week because of the holiday.

With tin plate specifications declining seasonably, tin mills have been quick to embrace the opportunity to allow their releases to accumulate, and the same is true of sheet and strip plants. The latter products have been most seriously affected by reduced automotive buying, while the sheet industry is likewise suffering from reduced consumption among railroad car builders, agricultural implement makers and manufacturers of electrical refrigerators.

Pipe mill activity remains the outstanding favorable factor in the situation, and, as most of the large projects placed recently are scheduled for completion this year, production in seamless lapwelded and electrically welded tube mills is being stepped up rapidly. Reinforcing bars also continue active, and a fair amount of structural tonnage is being placed. However, new inquiries for both structural and reinforcing steel seem to be less numerous.

On the basis of recent sales, prices of plates, shapes and bars are revised to a range of 1.65c. to 1.75c., Pittsburgh. Shading of prices on desirable tonnage has weakened the market on these products and has brought formal recognition of the lower level. Small lots of bars continue to go at 1.75c., with 1.70c. applying on ordinary sales of plates and shapes.

Weakness in wire nails has spread to this district from the Eastern markets, and sales at $2.05 and $2.10, Pittsburgh, are freely reported. Hot-rolled strip is more readily quoted at 1.65c. for wide and 1.75c. for narrow to fair-sized buyers, and weakness persists in galvanized sheets, which are now quotable at 3.15c., with concessions to 3.10c. to large jobbers.

Pig Iron.—Producers in this district cannot remember when the approach of a new quarter developed so little interest in future pig iron requirements. The Westinghouse Electric & Mfg. Co. has not closed against its third quarter inquiry for Trafford City, Pa., and Cleveland, and other inquiry is almost entirely lacking. A few large buyers are said to have quietly renewed old contracts at unchanged prices, and smaller foundries are entering the market from time to time for carload lots. Prices are admittedly weak, but clearcut sales which might establish quotations at a lower level are lacking. Valley furnaces are meeting the freight rate advantage of the Neville Island producer when selling in the Pittsburgh territory, and are also willing to make concessions in competitive territory surrounding their natural selling area.

Prices per gross ton, f.o.b. Valley furnace:

Basic	$18.50
Bessemer	19.00
Gray forge	18.00
No. 2 foundry	18.50
No. 3 foundry	18.00
Malleable	19.00
Low phos., copper free	$26.66 to 27.00

Freight rate to Pittsburgh or Cleveland district, $1.76.

Prices per gross ton, f.o.b. Pittsburgh district furnace:

Basic	$19.00
No. 2 foundry	19.00
No. 3 foundry	18.50
Malleable	19.50

Freight rates to points in Pittsburgh district range from 63c. to $1.13.

Semi-Finished Steel.—Demand for billets, slabs and sheet bars is extremely light, and little, if any, third quarter contracting is reported in this district. Many consumers have sufficient tonnage coming to them on old contracts to supply their probable light requirements during the next two months, and no marked activity is expected before fall. The market is nominally quoted at $31 to $32, Pittsburgh, although in the Youngstown and Cleveland districts the higher price seems to have disappeared. Wire rods are unchanged at $36, Pittsburgh or Cleveland, and producers who have opened their books for third quarter are contracting with their customers at that figure.

Recent concessions on plates, shapes and bars bring recognition of lower price level on these products.

* * *

Fresh price weakness in nails brings range down to $2.05 to $2.10 per keg.

* * *

Galvanized sheets at 3.15c., Pittsburgh, with concessions to large jobbers.

* * *

Market situation for July in doubt as many consuming plants plan shutdowns.

* * *

Scrap market steadier, with some minor price advances.

Bars, Plates and Shapes.—Mills in this district are quoting 1.65c. to 1.75c., Pittsburgh, on bars and 1.65c. to 1.70c. on plates and shapes.

Well sustained demand for reinforcing steel bars is the most favorable factor in the market on heavy hot-rolled products. A power dam at Safe Harbor, Pa., requiring about 2000 tons of bars, has been let recently. Otherwise, awards have been negligible, and with the building season well along, fewer new projects are coming out for bids. The same might be said for the structural steel market, and many smaller fabricators are having difficulty in maintaining a 50 per cent operation. Conditions are generally better in the larger shops, which are better equipped to meet the depressed price situation and take on backlog tonnage at very low profit margins. With one or two exceptions, barge yards are running very slowly, but a fair demand for plates is coming from makers of oil well equipment. Tank builders are increasing their requirements, and improved operations in line pipe units have enabled the larger mills to run better on plates and skelp.

Rails and Track Supplies.—The bulk of the major orders of the large roads has been rolled, and mill operations are tapering. This is also true in the case of track accessories, but a few users have extended their specifications over a longer period than usual this year and may help to maintain operations at a reduced rate during the summer.

Tubular Goods.—The greater part of the year's line pipe tonnage has apparently been placed, and mills are rapidly stepping up operations which may easily be maintained at close to capacity for four to six months. For the remainder of the season, attention will be focused on speed of deliveries, as most of the recent projects let call for completion before winter. With recent orders principally for lapwelded, electrically welded and seamless pipe in sizes from 24 to 6 in., demand for buttweld material has failed to show appreciable improvement, and is at least 20 per cent below normal requirements. Mechanical tubing is also very quiet, but business in oil country goods has been somewhat better this month than during May.

Wire Products.—The summer lull in steel mill activity has been severely felt by wire departments, and mills are dropping production steadily. This is particularly noticeable in the case of manufacturers' wire, which had been fairly active in the last few months. On nails and other merchant wire products, there seems little opportunity for further curtailment, although business is undoubtedly slower this month than last. Prices on nails have again developed weakness, and even in the Pittsburgh district jobbers claim to have quotations of $2.05 and $2.10. This figure has been rather common in the eastern part of the State, and even lower prices have developed in Atlantic Seaboard cities. Manufacturers' wire is holding very well at 2.30c., Pittsburgh.

Sheets. — Further curtailment in automobile production has brought about sharp drops in sheet mill operations during the last week, and even less activity is expected in the first

The Iron Age Composite Prices

Finished Steel

June 24, 1930, 2.185c. a Lb.

One week ago	2.214c.
One month ago	2.214c.
One year ago	2.412c.

Based on steel bars, beams, tank plates, wire, rails, black pipe and black sheets. These products make 87 per cent of the United States output of finished steel.

	High	Low
1930	2.362c., Jan. 7;	2.185c., June 24
1929	2.412c., April 2;	2.362c., Oct. 29
1928	2.391c., Dec. 11;	2.314c., Jan. 3
1927	2.453c., Jan. 4;	2.293c., Oct. 25
1926	2.453c., Jan. 5;	2.403c., May 18
1925	2.560c., Jan. 6;	2.396c., Aug. 18

Pig Iron

June 24, 1930, $17.42 a Gross Ton

One week ago	$17.50
One month ago	17.58
One year ago	18.63

Based on average of basic iron at Valley furnace and foundry irons at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

	High	Low
1930	$18.21, Jan. 7;	$17.42, June 24
1929	18.71, May 14;	18.21, Dec. 17
1928	18.59, Nov. 27;	17.04, July 24
1927	19.71, Jan. 4;	17.54, Nov. 1
1926	21.54, Jan. 5;	19.46, July 13
1925	22.50, Jan. 13;	18.96, July 7

Mill Prices of Finished Iron and Steel Products

Iron and Steel Bars

Soft Steel

	Base per Lb.
F.o.b. Pittsburgh mill	1.65c. to 1.75c.
F.o.b. Chicago	1.75c. to 1.85c.
Del'd Philadelphia	1.75c. to 1.85c.
Del'd New York	2.08c.
F.o.b. Cleveland	1.75c.
F.o.b. Lackawanna	1.75c. to 1.85c.
F.o.b. Birmingham	1.95c. to 2.00c.
C.i.f. Pacific ports	2.35c.
F.o.b. San Francisco mills	2.35c.

Billet Steel Reinforcing

F.o.b. P'gh mills, 40, 50, 60-ft.	1.75c.
F.o.b. P'gh mills, cut lengths	1.90c. to 2.00c.
F.o.b. Birmingham, mill lengths	1.95c. to 2.00c.

Rail Steel

F.o.b. mills, east of Chicago dist.	1.65c. to 1.70c.
F.o.b. Chicago Heights mill	1.75c.
Del'd Philadelphia	1.94c. to 1.99c.

Iron

Common iron, f.o.b. Chicago	1.90c.
Refined iron, f.o.b. P'gh mills	2.75c.
Common iron, del'd Philadelphia	2.09c.
Common iron, del'd New York	2.14c.

Tank Plates

	Base per Lb.
F.o.b. Pittsburgh mill	1.65c. to 1.70c.
F.o.b. Chicago	1.75c. to 1.80c.
F.o.b. Birmingham	1.95c. to 2.00c.
Del'd Cleveland	1.88½c.
Del'd Philadelphia	1.90½c. to 1.95½c.
F.o.b. Coatesville	1.75c. to 1.80c.
F.o.b. Sparrows Point	1.75c. to 1.80c.
F.o.b. Lackawanna	1.75c. to 1.80c.
Del'd New York	1.93c. to 1.98c.
C.i.f. Pacific ports	2.25c.

Structural Shapes

	Base per Lb.
F.o.b. Pittsburgh mill	1.65c. to 1.70c.
F.o.b. Chicago	1.75c. to 1.80c.
F.o.b. Birmingham	1.95c. to 2.00c.
F.o.b. Lackawanna	1.75c. to 1.80c.
F.o.b. Bethlehem	1.75c. to 1.80c.
Del'd Cleveland	1.88½c.
Del'd Philadelphia	1.81c. to 1.86c.
Del'd New York	1.90½c. to 1.95½c.
C.i.f. Pacific ports	2.35c.

Hot-Rolled Hoops, Bands and Strips

	Base per Lb.
6 in. and narrower, P'gh	1.75c. to 1.80c.
Wider than 6 in., P'gh	1.65c. to 1.70c.
6 in. and narrower, Chicago	1.90c.
Wider than 6 in., Chicago	1.80c.
Cooperage stock, P'gh	2.10c.
Cooperage stock, Chicago	2.20c.

Cold-Finished Steel

	Base per Lb.
Bars, f.o.b. Pittsburgh mill	2.10c.
Bars, f.o.b. Chicago	2.10c.
Bars, Cleveland	2.10c.
Bars, Buffalo	2.10c.
Shafting, ground, f.o.b. mill	*2.45c. to 3.40c.
Strips, P'gh	2.45c. to 2.55c.
Strips, Cleveland	2.45c. to 2.55c.
Strips, del'd Chicago	2.73c. to 2.83c.
Strips, Worcester	2.60c. to 2.70c.
Fender stock, No. 20 gage, Pittsburgh or Cleveland	3.80c.

*According to size.

Wire Products

(Carload lots, f.o.b. Pittsburgh and Cleveland.)

To Merchant Trade

	Base per Keg
Standard wire nails	$2.05 to $2.25
Cement coated nails	2.15 to 2.25
Galvanized nails	4.15 to 4.25

	Base per Lb.
Polished staples	2.60c. to 2.70c.
Galvanized staples	2.85c. to 2.90c.
Barbed wire, galvanized	2.80c. to 2.90c.
Annealed fence wire	2.30c. to 2.40c.
Galvanized wire, No. 9	2.75c. to 2.85c.
Woven wire fence (per net ton to retailers)	$65.00

To Manufacturing Trade

Bright hard wire, Nos. 6 to 9 gage	2.30c.
Spring wire	3.30c.

(Carload lots, f.o.b. Chicago)

Wire nails	$2.20 to $2.30 (keg)
Annealed fence wire	2.40c. to 2.50c. (lb.)
Bright hard wire to manufacturing trade	2.35c.

Anderson, Ind., mill prices are ordinarily $1 a ton over Pittsburgh base; Duluth, Minn., and Worcester, Mass., mill $2 a ton over Pittsburgh, and Birmingham mill $3 a ton over Pittsburgh.

Light Plates

	Base per Lb.
No. 10, blue annealed, f.o.b. P'gh	2.00c.
No. 10, blue annealed, f.o.b. Chicago dist.	2.10c.
No. 10, blue annealed, del'd Phila.	2.32c. to 2.42c.
No. 10, blue annealed, B'ham	2.20c.

Sheets

Blue Annealed

	Base per Lb.
No. 13, f.o.b. P'gh	2.15c.
No. 13, f.o.b. Chicago dist.	2.25c.
No. 13, del'd Philadelphia	2.44c. to 2.54c.
No. 13, blue annealed, B'ham	2.35c.

Continuous Mill Sheets

No. 10 gage, f.o.b. P'gh	1.80c. to 1.90c.
No. 13 gage, f.o.b. P'gh	1.95c. to 2.05c.

(Usual range 24 in. to 48 in. wide)

Box Annealed, One Pass Cold Rolled

No. 24, f.o.b. Pittsburgh	2.55c.
No. 24, f.o.b. Chicago dist. mill	2.65c.
No. 24, del'd Philadelphia	2.84c.
No. 24, f.o.b. Birmingham	2.70c.

Steel Furniture Sheets

No. 24, f.o.b. P'gh	3.70c.

Galvanized

No. 24, f.o.b. Pittsburgh	3.15c. to 3.20c.
No. 24, f.o.b. Chicago dist. mill	3.25c. to 3.30c.
No. 24, del'd Cleveland	3.43½c.
No. 24, del'd Philadelphia	3.44c. to 3.49c.
No. 24, f.o.b. Birmingham	3.35c. to 3.40c.

Tin Mill Black Plate

No. 28, f.o.b. Pittsburgh	2.75c. to 2.90c.
No. 28, f.o.b. Chicago dist. mill	2.90c. to 3.00c.

Automobile Body Sheets

No. 20, f.o.b. Pittsburgh	3.60c.

Long Ternes

No. 24, 8 lb. coating, f.o.b. mill	3.65c. to 3.75c.

Vitreous Enameling Stock

No. 24, f.o.b. Pittsburgh	3.80c.

Tin Plate

	Per Base Box
Standard cokes, f.o.b. P'gh district mills	$5.25
Standard cokes, f.o.b. Gary	5.35

Terne Plate

(*F.o.b. Morgantown or Pittsburgh*)

(Per Package, 20 x 28 in.)

8-lb. coating I.C. $10.30	25-lb. coating I.C. $15.20
15-lb. coating I.C. 12.90	30-lb. coating I.C. 16.00
20-lb. coating I.C. 14.00	40-lb. coating I.C. 17.80

Alloy Steel Bars

(F.o.b. maker's mill)

Alloy Quantity Bar Base, 2.65c. per Lb.

S.A.E. Series Numbers		Alloy Differential
2000	(½% Nickel)	$0.25
2100	(1½% Nickel)	0.55
2300	(3½% Nickel)	1.50
2500	(5% Nickel)	2.25
3100	Nickel Chromium	0.55
3200	Nickel Chromium	1.35
3300	Nickel Chromium	3.80
3400	Nickel Chromium	3.20
4100	Chromium Molybdenum (0.15 to 0.25 Molybdenum)	0.50
4100	Chromium Molybdenum (0.25 to 0.40 Molybdenum)	0.70
4600	Nickel Molybdenum (0.20 to 0.30 Molybdenum, 1.25 to 1.75 Nickel)	1.05
5100	Chromium Steel (0.60 to 0.90 Chromium)	0.35
5100	Chromium Steel (0.80 to 1.10 Chromium)	0.45
5100	Chromium Spring Steel	0.20
6100	Chromium Vanadium Bar	1.20
6100	Chromium Vanadium Spring Steel	0.95
9250	Silicon Manganese Spring Steel (flats)	0.25
	Rounds and squares	0.50
	Chromium Nickel Vanadium	1.50
	Carbon Vanadium	0.95

Above prices are for hot rolled steel bars, forging quality. The differential for cold-drawn bars is ¾c. a lb. higher, with standard classification for cold-finished alloy steel bars applying. For billets 4 x 4 to 10 x 10 in., the price for a gross ton is the net price for bars of the same analysis.

Billets under 4 x 4 in. carry the steel bar base. Slabs with a sectional area of 16 in. or over carry the billet price. Slabs with sectional area of less than 16 in. or less than 2½ in. thick, regardless of sectional area, take the bar price.

Rails

	Per Gross Ton
Standard, f.o.b. mill	$43.00
Light (from billets), f.o.b. mill	34.00
Light (from rail steel), f.o.b. mill	32.00
Light (from billets), f.o.b. Ch'go mill	36.00

Track Equipment

	Base per 100 Lb.
Spikes, ⅝ in. and larger	$2.80
Spikes, ½ in. and smaller	2.80
Spikes, boat and barge	3.00
Tie plate, steel	2.07½
Angle bars	$2.75
Track bolts, to steam railroads	$3.80 to 4.00
Track bolts, to jobbers, all sizes, per 100 count	73 per cent off list

Welded Pipe

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio, Mills

Butt Weld

Steel Inches	Black	Galv.	Iron Inches	Black	Galv.
⅛	47	21½	¼ and ⅜	+11	+36
¼ to ⅜	53	27½	½	23	5
½	58	44½	¾	28	11
¾	62	50½	1 and 1¼	31	15
1 to 3	64	52½	1½ and 2	35	18

Lap Weld

2	57	45½	2	23	9
2½ to 6	61	49½	2½ to 3½	28	13
7 and 8	58	45½	4 to 6	30	17
9 and 10	56	43½	7 and 8	29	16
11 and 12	55	42½	9 to 12	26	11

Butt Weld, extra strong, plain ends

⅛	43	26½	¼ and ⅜	+13	+48
¼ to ⅜	49	32½	½	23	7
½	55	44½	¾	28	12
¾	60	49½	1 to 2	34	18
1 to 1½	62	51½			
2 to 3	63	52½			

Lap Weld, extra strong, plain ends

2	55	44½	2	29	13
2½ to 4	59	48½	2½ to 4	34	20
4½ to 6	58	47½	4½ to 6	33	19
7 to 8	54	41½	7 and 8	31	17
9 and 10	47	34½	9 to 12	21	8
11 and 12	46	33½			

On carloads the above discounts on steel pipe are increased on black by one point, with supplementary discount of 5%, and on galvanized by 1½ points, with supplementary discount of 5%. On iron pipe, both black and galvanized, the above discounts are increased to jobbers by one point with supplementary discount of 5 and 2½%.

Note.—Chicago district mills have a base two points less than the above discounts. Chicago delivered base is 2½ points less. Freight is figured from Pittsburgh, Lorain, Ohio, and Chicago district mills, the billing being from the point producing the lowest price to destination.

Boiler Tubes

Base Discounts, f.o.b. Pittsburgh

Steel		Charcoal Iron	
2 in. and 2¼ in.	38	1½ in.	1
2½ in.—2¾ in.	46	1¾ in.	8
3 in.	52	2 in.—2¼ in.	13
3¼ in.—3¾ in.	54	2½ in.—2¾ in.	16
4 in.	57	3 in.	17
4½ in. to 6 in.	46	3¼ in. to 3½ in.	18
		4 in.	20
		4½ in.	21

On lots of a carload or more, the above base discounts are subject to a preferential of two fives on steel and of 10 per cent on charcoal iron tubes. Smaller quantities are subject to the following modifications from the base discounts:

Lap Welded Steel—Under 10,000 lb., 6 points under base and one five; 10,000 lb. to carload, 4 points under base and two fives. Charcoal Iron—Under 10,000 lb., 2 points under base; 10,000 lb. to carload, base and one five.

Standard Commercial Seamless Boiler Tubes

Cold Drawn

1 in.	61	3 in.	46
1¼ to 1½ in.	53	3¼ to 3½ in.	48
1¾ in.	37	4 in.	51
2 to 2¼ in.	32	4½, 5 and 6 in.	40
2½ to 2¾ in.	40		

Hot Rolled

2 and 2¼ in.	38	3¼ to 3½ in.	54
2½ and 2¾ in.	46	4 in.	57
3 in.	52	4½, 5 and 6 in.	46

Beyond the above base discount a preferential discount of 5 per cent is allowed on carload lots. On less than carloads to 10,000 lb., base discounts are reduced 4 points with 5 per cent preferential; on less than 10,000 lb., base discounts are reduced 6 points, with no preferential. No extra for lengths up to and including 24 ft. Sizes smaller than 1 in. and lighter than standard gages take the mechanical tube list and discounts. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.

Seamless Mechanical Tubing

	Per Cent Off List
Carbon, 0.10% to 0.30% base (carloads)	55
Carbon, 0.30% to 0.40% base	50

Plus differentials for lengths over 18 ft. and for commercial exact lengths. Warehouse discounts on small lots are less than the above.

week of the new month because of the week-end holiday. In Pittsburgh and nearby districts sheet mill schedules range from 50 to 55 per cent of capacity, with complete suspensions not exceptional.

Although one large producer has opened its third quarter books at 2.55c., Pittsburgh, for black, 3.20c. for galvanized, 2c. at light plates, and 2.15c. for blue annealed sheets, other mills have not followed suit, and are waiting further market developments. Higher prices before the end of the quarter might make such contracts inadvisable, but with the present tendency toward further weakness it is not likely that much sheet steel will be shipped before Oct. 1 at prices over the present levels. Consumers are not anxious to make future commitments, and with new buying very limited little opportunity is offered to test prevailing prices.

Weakness persists in galvanized sheets, with quotations of 3.15c. to consumers and 3.10c. to some large jobbers. Terne plate quotations have been reduced, with the leading interest now quoting $10.30 per package, Pittsburgh, for the 8-lb. coating stock. Relative reductions have been made on the other coatings.

Tin Plate.—Mill operations are gradually declining, but are still maintained at about 75 per cent of capacity for the industry as a whole. Next week will see complete suspensions in several plants, as mills have no need for additional stock and will gladly embrace the holiday as an excuse to shut down.

Strip Steel. — Demand for strip steel is declining sharply, and with the promise of considerably reduced automobile production next month even lower production levels may be anticipated. The strip steel industry is running at about 50 per cent on hot-rolled material, and not more than 25 per cent on cold-rolled. Smaller consuming interests are maintaining their requirements at a fair rate, although suspensions during July and August will bring considerable curtailment. Prices on cold-rolled material are fairly steady at 2.45c., Pittsburgh, while concessions of $1 a ton on hot-rolled have become more general. On materials 6 in. and narrower the market is quotable at 1.75c. to 1.80c., with 1.65c. to 1.70c. representative on the wider sizes.

Coal and Coke.—Furnace coke is still very quiet, and spot demand negligible. A slight increase in production in the Connellsville region is thought to have little market significance, and may indicate further curtailment later on. The price is unchanged at $2.50, Connellsville. Foundry coke is dull and coal production continues to recede in a listless market.

Old Material.—Scattered buying of small lots of heavy melting steel in the last week has maintained the scrap market at a $15 average price. Two mills bought fair-sized tonnages at this figure, while railroad steel was sold at at least two points for 50c. more. Some dealers are able to buy against old contracts at as low as $14.50, but buying prices range up to $15 where a good grade of scrap is desirable. This necessitates a range of $14.50 to $15.50 in order to cover the full spread of market activity.

Dealers are having difficulty in securing scrap to cover recent large orders and, with yard stocks practically dissipated, a shortage of readily accessible material is largely responsible for the maintenance of market prices. Most dealers would hesitate to sell a large tonnage of ordinary steel at $15 today if immediate fulfillment of the order was required.

Hydraulic compressed sheets were sold at one point at $15, but are scarce in this district because of reduced production in Michigan and buying in the Detroit territory by Lake consumers. A sale of heavy breakable cast at $12 advances that grade 50c. a ton, while machine shop turnings and blast furnaces scrap are weaker in the face of light demand. Specialties are also off slightly, and the other grades are quotable only at nominal figures.

Prices per gross ton delivered consumers' yards in Pittsburgh and points taking the Pittsburgh district freight rate:

Basic Open-Hearth Grades:	
No. 1 heavy melting steel	$14.50 to $15.50
No. 2 heavy melting steel	13.00 to 13.50
Scrap rails	14.50 to 15.00
Compressed sheet steel	14.75 to 15.00
Bundled sheets, sides and ends	13.00 to 13.50
Cast iron carwheels	15.50 to 16.00
Sheet bar crops, ordinary	15.50 to 16.00
Heavy breakable cast	11.50 to 12.00
No. 2 railroad wrought	14.75 to 15.25
Hvy. steel axle turnings	12.50 to 13.00
Machine shop turnings	9.25 to 9.75
Acid Open-Hearth Grades:	
Railr. knuckles and couplers	17.00 to 18.00
Railr. coil and leaf springs	17.00 to 18.00
Rolled steel wheels	17.00 to 18.00
Low phos. billet and bloom ends	19.50 to 20.00
Low phos. mill plates	17.00 to 17.50
Low phos. light grades	17.00 to 17.50
Low phos. sheet bar crops	18.00 to 18.50
Heavy steel axle turnings	12.50 to 13.00
Electric Furnace Grades:	
Low phos. punchings	17.50 to 18.00
Heavy steel axle turnings	12.50 to 13.00
Blast Furnace Grades:	
Short shoveling steel turnings	9.50 to 10.00
Short mixed borings and turnings	9.50 to 10.00
Cast iron borings	9.50 to 10.00
Rolling Mill Grades:	
Steel car axles	21.50 to 22.50
Cupola Grades:	
No. 1 cast	14.00 to 14.50
Rails 3 ft. and under	17.00 to 17.50

Warehouse Prices, f.o.b. Pittsburgh

	*Base per Lb.
Plates	3.00c.
Structural shapes	3.00c.
Soft steel bars and small shapes	2.90c.
Reinforcing steel bars	2.75c.
Cold-finished and screw stock—	
Rounds and hexagons	3.35c.
Squares and flats	3.85c.
Bands	3.25c.
Hoops	4.25c.
Black sheets (No. 24), 25 or more bundles	3.50c.
Galv. sheets (No. 24), 25 or more bundles	4.15c.
Light plates, blue annealed (No. 10), 1 to 24 plates	2.85c.
Blue annealed sheets (No. 13)	3.00c.
Galv. corrug. sheets (No. 28), per square	4.03c.
Spikes, large	3.40c.
Small	3.80c. to 5.25c.
Boat	3.80c.
Track bolts, all sizes, per 100 count,	60 and 10 per cent off list
Machine bolts, 100 count,	60 and 10 per cent off list
Carriage bolts, 100 count,	60 and 10 per cent off list
Nuts, all styles, 100 count,	60 and 10 per cent off list
Large rivets, base per 100 lb.	$3.30
Wire, black, soft ann'l'd, base per 100 lb.	$2.60 to 2.70
Wire, galv. soft, base per 100 lb.	3.20 to 3.30
Common wire nails, per keg	2.45
Cement coated nails, per keg	2.65 to 2.80

*On plates, structurals, bars, reinforcing bars, bands, hoops and blue annealed sheets, base applies to orders of 400 to 3999 lb.

Youngstown

Pipe Business Will Help to Sustain July Steel Output

YOUNGSTOWN, June 24.—Operating schedules of steel companies for the last week in June show that the industry will not maintain in the current month the operating average of May. Declines in production during this month are accentuated in schedules as announced for this week, which indicate an average operating rate of 60 per cent.

The Carnegie Steel Co. reduces operations to an average rate of 58 per cent. The Newton Steel Co. declines to a 40 per cent average, its lowest in several years. On the other hand, the Mahoning Valley Steel Co. at Niles, and the Falcon plant at Niles of the Empire Steel Corporation, Mansfield, resume production.

Of 51 independent open-hearth furnaces, 28 are scheduled, with Bessemer steel output at 60 per cent. There is an increase in the number of active sheet mills in the Valley to 63 of 120 total, against 47 rolling a week ago. Not all of the mills, however, are scheduled for a full week's rolling.

Both of the larger independents, the Republic Steel Corporation and the Youngstown Sheet & Tube Co., are maintaining 65 per cent average.

Independent tin plate mills are averaging 60 per cent, while hot strip mills are closer to 65 per cent, which represents a moderate gain in output. It is expected that pipe output in July will help to maintain a satisfactory average in an otherwise declining and somewhat irregular market.

Republic Steel Corporation will concentrate July 1 at 332 South Michigan Avenue all of the Chicago sales offices of its subsidiaries. This will include the following units: Interstate Iron & Steel, Union Drawn Steel, Central Alloy, Bourne-Fuller and Donner Steel.

Semi-Finished Steel, Raw Materials, Bolts and Rivets

Mill Prices of Semi-Finished Steel

Billets and Blooms

	Per Gross Ton
Rerolling, 4-in. and under 10-in., Pittsburgh	$31.00 to $32.00
Rerolling, 4-in. and under 10-in., Youngstown	31.00
Rerolling, 4-in. and under 10-in., Cleveland	31.00
Rerolling, 4-in. and under 10-in., Chicago	33.00
Forging quality, Pittsburgh	36.00 to 37.00

Sheet Bars

(Open Hearth or Bessemer)

	Per Gross Ton
Pittsburgh	$31.00 to $32.00
Youngstown	31.00 to 32.00
Cleveland	31.00

Slabs

(8 in. x 2 in. and under 10 in. x 10 in.)

	Per Gross Ton
Pittsburgh	$31.00 to $32.00
Youngstown	31.00
Cleveland	31.00

Skelp

(F.o.b. Pittsburgh or Youngstown)

	Per Lb.
Grooved	1.70c. to 1.80c.
Universal	1.70c. to 1.80c.
Sheared	1.70c. to 1.80c.

Wire Rods

(Common soft, base)

	Per Gross Ton
Pittsburgh	$36.00
Cleveland	36.00
Chicago	37.00

Prices of Raw Material

Ores

Lake Superior Ores, Delivered Lower Lake Ports

	Per Gross Ton
Old range Bessemer, 51.50% iron	$4.80
Old range non-Bessemer, 51.50% iron	4.65
Mesabi Bessemer, 51.50% iron	4.65
Mesabi non-Bessemer, 51.50% iron	4.50
High phosphorus, 51.50% iron	4.40

Foreign Ore, c.i.f. Philadelphia or Baltimore

	Per Unit
Iron ore, low phos., copper free, 55 to 58% iron in dry Spanish or Algeria	12.00c.
Iron ore, low phos., Swedish, average 68% iron	12.00c.
Iron ore, basic Swedish, average 65% iron	10.00c.
Manganese ore, washed 52% manganese, from the Caucasus	30.00c.
Manganese ore, Brazilian, African or Indian, basic 50%	30.00c.
Tungsten ore, high grade, per unit, in 60% concentrates	$14.00 to $16.50

	Per Gross Ton
Chrome ore, 45 to 50% Cr_2O_3, crude, c.i.f. Atlantic seaboard	$22.00 to $24.00

	Per Lb.
Molybdenum ore, 85% concentrates of MoS_2, delivered	50c. to 55c.

Coke

	Per Net Ton
Furnace, f.o.b. Connellsville prompt	$2.50
Foundry, f.o.b. Connellsville prompt	$3.25 to 4.75
Foundry, by-products, Ch'go ovens	8.00
Foundry, by-products, New England, del'd	11.00
Foundry, by-product, Newark or Jersey City, delivered	9.00 to 9.40
Foundry, by-product, Phila.	9.00
Foundry, Birmingham	5.00
Foundry, by-product, St. Louis, f.o.b. ovens	8.00
Foundry by-prod., del'd St. Louis	9.00

Coal

	Per Net Ton
Mine run steam coal, f.o.b. W. Pa. mines	$1.25 to $1.75
Mine run coking coal, f.o.b. W. Pa. mines	1.50 to 1.75
Gas coal, ¾-in., f.o.b. Pa. mines	1.90 to 2.00
Mine run gas coal, f.o.b. Pa. mines	1.65 to 1.75
Steam slack, f.o.b. W. Pa. mines	90c. to 1.10
Gas slack, f.o.b. W. Pa. mines	1.00 to 1.25

Ferromanganese

	Per Gross Ton
Domestic, 80%, seaboard	$94.00 to $99.00
Foreign, 80%, Atlantic or Gulf port, duty paid	94.00 to 99.00

Spiegeleisen

	Per Gross Ton Furnace
Domestic, 19 to 21%	$31.00 to $34.00
Domestic, 16 to 19%	29.00 to 32.00

Electric Ferrosilicon

	Per Gross Ton Delivered
50%	$83.50
75%	130.00

	Per Gross Ton Furnace		Per Gross Ton Furnace
10%	$35.00	12%	$39.00
11%	37.00	14 to 16%	39.00

Bessemer Ferrosilicon

F.o.b. Jackson County, Ohio, Furnace

	Per Gross Ton		Per Gross Ton
10%	$30.00	13%	$34.00
11%	32.00	14%	36.00
12%	34.00	15%	39.00

Silvery Iron

F.o.b. Jackson County, Ohio, Furnace

	Per Gross Ton		Per Gross Ton
6%	$21.50	11%	$24.50
7%	22.00	12%	25.50
8%	22.50	13%	26.50
9%	23.00	14%	28.50
10%	23.50	15%	31.50

Other Ferroalloys

Ferrotungsten, per lb. contained metal del'd	$1.30 to $1.40
Ferrochromium, 4 to 6% carbon and up, 65 to 70% Cr., per lb. contained Cr. delivered, in carloads	11.00c.
Ferrovanadium, per lb. contained vanadium, f.o.b. furnace	$3.15 to $3.65
Ferrocarbontitanium, 15 to 18%, per net ton, f.o.b. furnace, in carloads	$160.00
Ferrophosphorus, electric or blast furnace material, in carloads, 18%, Rockdale, Tenn., base, per gross ton	$91.00
Ferrophosphorus, electric 24%, f.o.b. Anniston, Ala., per gross ton	$122.50

Fluxes and Refractories

Fluorspar

	Per Net Ton
Domestic, 85% and over calcium fluoride, not over 5% silicon, gravel, f.o.b. Illinois and Kentucky mines	$18.00
No. 2 lump, Illinois and Kentucky mines	20.00
Foreign, 85% calcium fluoride, not over 5% silica, c.i.f. Atlantic port, duty paid	$18.00 to 18.50
Domestic, No. 1 ground bulk, 95 to 98% calcium fluoride, not over 2½% silica, f.o.b. Illinois and Kentucky mines	32.50

Fire Clay Brick

	Per 1000 f.o.b. Works	
	High-Heat Duty Brick	Intermediate Heavy Duty Brick
Pennsylvania	$43.00 to $46.00	$35.00 to $38.00
Maryland	43.00 to 46.00	35.00 to 38.00
New Jersey	50.00 to 65.00	.....
Ohio	43.00 to 46.00	35.00 to 38.00
Kentucky	43.00 to 46.00	35.00 to 38.00
Missouri	43.00 to 46.00	35.00 to 38.00
Illinois	43.00 to 46.00	35.00 to 38.00
Ground fire clay, per ton	7.00	

Silica Brick

	Per 1000 f.o.b. Works
Pennsylvania	$43.00
Chicago	52.00
Birmingham	50.00
Silica clay, per ton	$8.50 to 10.00

Magnesite Brick

	Per Net Ton
Standard sizes, f.o.b. Baltimore and Chester, Pa.	$65.00
Grain magnesite, f.o.b. Baltimore and Chester, Pa.	40.00
Standard size	45.00

Chrome Brick

	Per Net Ton
Standard size	$45.00

Mill Prices of Bolts, Nuts, Rivets and Set Screws

Bolts and Nuts

Per 100 Pieces

(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

	Per Cent Off List
†Machine bolts	73
†Carriage bolts	73
Lag bolts	73
Plow bolts, Nos. 1, 2, 3 and 7 heads	73
Hot-pressed nuts, blank or tapped, square	73
Hot-pressed nuts, blank or tapped, hexagons	73
C.p.c. and t. square or hex. nuts, blank or tapped	73
Washers*	7.00c. to 6.75c. per lb. off list

*F.o.b. Chicago, New York and Pittsburgh.

†Bolts with rolled thread up to and including ⅜ in. x 6 in. take 10 per cent lower list prices.

Bolts and Nuts

	Per Cent Off List
Semi-finished hexagon nuts	73
Semi-finished hexagon castellated nuts, S.A.E.	73
Stove bolts in packages, P'gh	80, 10, 10 and 5
Stove bolts in packages, Chicago	80, 10, 10 and 5
Stove bolts in packages, Cleveland	80, 10, 10 and 5
Stove bolts in bulk, P'gh	80, 10, 10, 5 and 2½
Stove bolts in bulk, Chicago	80, 10, 10, 5 and 2½
Stove bolts in bulk, Cleveland	80, 10, 10, 5 and 2½
Tire bolts	60, 10 and 10

Discounts of 73 per cent off on bolts and nuts applied on carload business.

Large Rivets

(½-in. and larger)

	Base per 100 Lb.
F.o.b. Pittsburgh or Cleveland	$2.90
F.o.b. Chicago	3.00

Small Rivets

(⅞-in. and smaller)

	Per Cent Off List
F.o.b. Pittsburgh	70, 10 and 5
F.o.b. Cleveland	70, 10 and 5
F.o.b. Chicago	70, 10 and 5

Cap and Set Screws

(Freight allowed up to but not exceeding 50c. per 100 lb. on lots of 200 lb. or more)

	Per Cent Off List
Milled cap screws	80, 10, 10 and 5
Milled standard set screws, case hardened,	80 and 5
Milled headless set screws, cut thread	75 and 10
Upset hex. head cap screws, U.S.S. thread,	85 and 10
Upset hex. cap screws, S.A.E. thread	85 and 10
Upset set screws	80, 10 and 5
Milled studs	70

CHICAGO

Bars, Plates and Shapes Lower in Price—Pig Iron Down 50c. a Ton

CHICAGO, June 24.—The local steel market is without color. The spotty character of new business points quite clearly to the course which business can reasonably be expected to follow in the next few weeks. Beginning next week the situation will be greatly influenced by vacations, which some industries will carry out in a broad way, amounting virtually to complete shutdowns of plants. The fact that many consumers of steel call a halt at this time of year to take inventory will also have its effect on steel demands. Hot weather is another factor in that it reduces the efficiency of men.

Prices of bars, plates and shapes have been revised to a range of 1.75c. to 1.85c. Pig iron prices in the local market have declined 50c. a ton to $18 for the No. 2 foundry grade.

A survey of mill operations in this district indicates quite a wide variation in output, not only among the various producers, but also as to mill departments. Rail rolling programs will practically vanish by mid-July. Stress for delivery of plates is accentuated by demand for line pipe material, while on the other hand bar mills are operating at not over 60 per cent of capacity, which is near the low point of the year. Average ingot output is a shade under 70 per cent of capacity. Deliveries on plates range from two to four weeks, while most shapes and bar sizes may be had promptly. Specifications are in such volume as to place them third when considering releases in the last seven weeks. Their character, however, is decidedly in favor of plates and to the detriment of rolling schedules of other finished steel mill products. New buying, also strongly influenced by the plate situation, is on a parity with new business in the previous week. The bulk of this is spot business, from which there seems to be no change in sight unless a slight pickup in inquiry this week can be taken as an indicator of what is to come. This is the first week for some time that there has not been a reduction in the number of active steel mill blast furnaces. There are still blowing 21 of 36 in the district.

Ferroalloys.—A boatload of Canadian spiegeleisen has been unloaded at a Chicago dock. It is reported that a part of the cargo is being held on the dock and that a part has been shipped inland.

Pig Iron.—The price of Northern furnace iron is established at $18 a ton, base grade, by several important sales made during the week. A melter in Wisconsin placed 2500 tons, and a user in central Illinois closed for 2000 tons. These and other sales have brought this week into prominence from the viewpoint of heavy purchases of pig iron. A stove company near Chicago is in the market for 1000 tons. The usually expected mid-year slump in melt is at hand. Shipments are off rather sharply and output has been curtailed at the merchant stacks that are in blast. Five merchant stacks are now active, the No. 4 Iroquois furnace having been blown out this week. Competition for going tonnages of silvery iron is extremely keen, and new business often means new low prices. The Southern iron market is quiet, with prices varying between $12 and $12.50 a ton, Birmingham.

Prices per gross ton at Chicago:

N'th'n No. 2 fdy., sil. 1.75 to 2.25	$18.00
N'th'n No. 1 fdy., sil. 2.25 to 2.75	18.50
Malleable, not over 2.25 sil.	18.00
High phosphorus	18.00
Lake Super. charc'l, sil. 1.50	27.04
S'th'n No. 2 fdy.	$18.01 to 18.51
Low phos., sil. 1 to 2, copper free	29.50
Silvery, sil. 8 per cent	27.29
Bess. ferrosilicon, 14-15 per cent	46.29

Prices are delivered consumers' yards except on Northern foundry, high phosphorus and malleable, which are f.o.b. local furnace, not including an average switching charge of 61c. per gross ton.

Bolts, Nuts and Rivets.—The inventory period in many industries, the vacation season and a general slackness in business have cut deeply into shipments of bolts, nuts and rivets to consuming industries. These conditions are most pronounced at farm implement and automobile manufacturing plants. Third quarter contracting is practically at an end. Discounts remain steady.

Warehouse Prices, f.o.b. Chicago

	Base per Lb.
Plates and structural shapes	3.10c.
Soft steel bars	3.00c.
Reinforc'g bars, billet steel—	
30 to 500 tons	2.00c.
500 tons and over	1.85c.
Rail steel reinforcement	1.65c. to 1.75c.
Cold-fin. steel bars and shafting—	
Rounds and hexagons	3.35c.
Flats and squares	3.85c.
Bands (⅛ in. in Nos. 10 and 12 gages)	3.20c.
Hoops (No. 14 gage and lighter)	3.75c.
Black sheets (No. 24)	4.05c.
Galv. sheets (No. 24)	4.60c.
Blue ann'l'd sheets (No. 10)	3.35c.
Spikes (⅝ in. and larger)	3.55c.
Track bolts	4.55c.
Rivets, structural	4.00c.
Rivets, boiler	4.00c.

	Per Cent Off List
Machine bolts	60 and 10
Carriage bolts	60 and 10
Coach or lag screws	60 and 10
Hot-pressed nuts, sq., tap. or blank,	60 and 10
Hot-pressed nuts, hex., tap. or blank,	60 and 10
No. 8 black ann'l'd wire, per 100 lb.	$3.45
Com. wire nails, base per keg	2.75
Cement c't'd nails, base per keg	2.85

Sheets.—The local sheet market continues listless, with little in view except the possibility that the roofing trade may, if it follows precedent, take larger tonnages after the beginning of July. Orders are for small quantities and arrive in sellers' hands with such irregularity as to cause difficulty in arranging rolling schedules. To make matters still worse from the viewpoint of producers, hot weather of the kind that hampers hot mill operations has spread over the Central West and early relief is not in sight. Specifications are extremely spotty and give no clew as to the drift of the market. However, in the last week or 10 days volume has remained somewhat steady. Nevertheless, this cannot be taken as a sign that the low point in demand has been reached.

Prices quoted for tonnages delivered at Chicago are 3.30c. to 3.35c. for galvanized sheets, 2.15c. for No. 10 blue annealed sheets and 2.70c. for black. Output by hot mills ranges from 50 to 55 per cent of capacity, which is a rate quite often experienced at this time of the year.

Base prices per lb., deliv'd from mill in Chicago: No. 24 black sheets, 2.70c.; No. 24 galv., 3.30c. to 3.35c.; No. 10 blue ann'l'd, 2.15c. Deliv'd prices at other Western points are equal to the freight from Gary, plus the mill prices, which are 5c. per 100 lb. lower than Chicago delivered prices.

Cast Iron Pipe.—Demand for this commodity is running true to seasonal form in that tonnages sought are lighter and in smaller numbers. Contractors are entering a period when they normally have a substantial volume of work on hand, but this year many of them are practically without work, and bidding for the few tonnages that appear is extremely keen. James B. Clow & Sons have taken 7000 ft. of 6 to 10-in. pipe for Fort Atkinson and Little Chute, Wis. The McWane Cast Iron Pipe Co. will furnish a tonnage for Pittsboro, Ind., and an unnamed bidder will supply 1000 tons for Painesville, Ohio. Chicago Heights, Ill., will readvertise for 2000 tons, and Medina, Ohio, will take bids this week on 125 tons of 2 to 8-in. pipe. Prices are stable at $37 to $38 a ton, Birmingham, for diameters 6 in. and larger.

Prices per net ton, deliv'd Chicago: Water pipe, 6-in. and over, $45 to $46; 4-in., $48 to $49; Class A and gas pipe, $3 extra.

Rails and Track Supplies.—Of foremost interest in this market is the purchase of 40,000 tons of standard-section rails by the Norfolk & Western. The United States Steel Corporation will furnish 30,000 tons and the Bethlehem Steel Corporation 10,000 tons. No word has been received here as to the disposal of the tonnage needed by the Santa Fe for a new line extending from Texas to Colorado, but the total rail inquiry of

this road has been increased to 60,000 tons.

Rail-rolling schedules are nearing the end. One Western mill expects to complete its program in the early days of July, and another unit may run through next month if hold-up orders, which are now in effect, are withdrawn. Output is little, if any, above 50 per cent of capacity.

Prices f.o.b. mill, per gross ton: Standard section open-hearth and Bess. rails, $43; light rails, rolled from billets, $36. *Per lb.:* Standard railroad spikes, 2.80c.; track bolts with square nuts, 3.80c.; steel tie plates, 2.07½c. to 2.15c.; angle bars, 2.75c.

Wire Products.—Operations at wire mills range from 45 to 50 per cent of capacity. The market is getting little support from the manufacturing trade, which has cut its use of wire to the low point of the year. Country trade is normally quiet at this time in the summer. Possibly the most encouraging news in the wire trade is that third quarter contracting is making some progress, this being evidenced by a number of contracts put on books in the last few days. Use of nails is small and movement from mills and warehouse is sluggish.

Reports from most sections of the country indicate that agricultural conditions as a whole are satisfactory.

Plates.—Foremost developments in this market continue to center around the activity of producers and distributers of oil and gas. The Gulf Oil Corporation plans to construct three refineries in Ohio and Pennsylvania in connection with the 1400-mile pipe line which is now being constructed by its affiliated company, the Union Gulf Corporation. A second 24-in. gas line extending from Oklahoma to Chicago is now under consideration. Construction may start about the time of completion of the line which is now being laid. Orders for the first unit called for 210,000 tons of main line and 100,000 tons of lateral lines in smaller sizes of pipe. A manufacturer of electrically welded pipe is exerting pressure on mills for deliveries of plates.

A refiner in the Southwest has ordered 1000 tons of plates for new tank construction. The railroad car market is exceptionally dull. The Illinois Central, which has about 2200 cars to place, has again deferred this business, and it is intimated that the matter will not again be taken up until after the middle of July.

Structural Material. — Awards in the week aggregate 10,000 tons, and fresh inquiries total 8000 tons. Fabricators report a greater number of small tonnage inquiries. Of special interest locally is the award of steel for an open-hearth building for the Wisconsin Steel Co. The Ford Motor Co. is in the market for 3300 tons of channels.

Orders for the Transportation Building for the World's Fair have been postponed, and public criticism has developed regarding the sums involved in bids for the Lane Technical High School in Chicago. Reports from the Rocky Mountain region show that awards for fabricated steel are light and few in number.

Prices of plates, shapes and bars revised downward.

* * *

Pig iron 50c. a ton lower in Chicago market.

* * *

Spotty character of steel business expected to continue during approaching vacation period.

* * *

Demand for plates outstanding in an otherwise dull market.

* * *

Scrap continues quiet, with no further important price changes.

Bars.—Demand for mild steel bars has turned unusually spotty, and current specifications are not supporting output above 60 per cent of local mill capacity. This condition is a reflection of the paucity of demand for deformed bars of the billet steel grade, a general lightening in manufacturing use and curtailed output on the part of agricultural machinery manufacturers. Deliveries are prompt on most sizes.

Although production dropped off several weeks, the output of alloy steel bars is steady when compared with the recent drop in shipments of mild steel bars.

The rail steel bar market remains spotty, with resultant frequent changes of rolls. Shipments to manufacturers of barn equipment are up, but shipments of fence post have dropped to the low point of the year.

Reinforcing Bars. — As gaged by fresh inquiries, this market holds only moderate promise for the immediate future. However, old projects, which are moving slowly, still represent a fair tonnage, and it is on these jobs that dealers are centering their attention. Miscellaneous road work is being placed from week to week and contractors are engaged in taking figures on the reinforcing bars needed.

The Milwaukee Road will take a round tonnage for a grain elevator to be erected at Milwaukee. This is the second project of this kind to come before the trade in the last month. Figures will soon be taken on the north approach to the Wabash Avenue bridge, Chicago, and additional bars may soon be needed for the extension of the outer drive across the Chicago River. Prices continue weak.

Coke. — Shipments of by-product foundry coke are off rather sharply in accordance with a lower melt. Many foundries either have entered or are planning to enter the mid-year inventory and vacation period. The price is steady at $8 a ton, f.o.b. local ovens.

Old Material.—A slight pickup is noticeable in small spot tonnages, on which buyers are asking prompt delivery. Many consumers of the heavy tonnage grades have taken advantage of the low prices and have put scrap in storage. The price structure is such that a similar move would seem to be in order on the part of yard operators, who have been moving cautiously in recent weeks.

From the viewpoint of the yard operator, the present appears to be the best speculative period in several years.

Steel mill reserves are well filled, one unit having the largest stock pile in 18 months. One steel producer has curtailed shipments very sharply and, while others are taking shipments at a steady rate, the tonnages accepted from day to day are measurably lower than those of several weeks ago.

Quotations are unchanged from a week ago except in the case of machinery cast, which is off 50c. a ton.

Prices deliv'd Chicago district consumers:

	Per Gross Ton	
Basic Open-Hearth Grades:		
Heavy melting steel	$12.00	$12.50
Shoveling steel	12.00	12.50
Frogs, switches and guards, cut apart, and misc. rails	13.00	13.50
Hydraul. compressed sheets	10.50	11.00
Drop forge flashings	8.50	9.00
No. 1 busheling	9.50	10.00
Forg'd cast and r'l'd steel carwheels	15.00	15.50
Railroad tires, charg. box size	15.50	16.00
Railroad leaf springs cut apart	15.50	16.00
Acid Open-Hearth Grades:		
Steel couplers and knuckles	13.50	14.00
Coil springs	16.00	16.50
Electric Furnace Grades:		
Axle turnings	11.50	12.00
Low phos. punchings	13.50	14.00
Low phos. plates, 12 in. and under	13.50	14.00
Blast Furnace Grades:		
Axle turnings	9.50	10.00
Cast iron borings	8.00	8.50
Short shoveling turnings	8.00	8.50
Machine shop turnings	6.25	6.75
Rolling Mill Grades:		
Iron rails	13.00	13.50
Rerolling rails	14.50	15.00
Cupola Grades:		
Steel rails, less than 3 ft.	13.75	14.25
Steel rails, less than 2 ft.	14.50	15.00
Angle bars, steel	13.25	13.75
Cast iron carwheels	13.50	14.00
Malleable Grades:		
Railroad	13.50	14.00
Agricultural	12.25	12.75
Miscellaneous:		
*Relaying rails, 56 to 60 lb.	23.00	25.00
*Relaying rails, 65 lb. and heav.	26.00	31.00
	Per Net Ton	
Rolling Mill Grades:		
Iron angle and splice bars	13.50	14.00
Iron arch bars and transoms	13.50	14.00
Iron car axles	24.00	24.50
Steel car axles	15.00	15.50
No. 1 railroad wrought	10.00	10.50
No. 2 railroad wrought	10.75	11.25
No. 1 busheling	7.50	8.00
No. 2 busheling	6.00	6.50
Locomotive tires, smooth	14.50	15.00
Pipes and flues	8.00	8.50
Cupola Grades:		
No. 1 machinery cast	12.00	12.50
No. 1 railroad cast	10.25	10.75
No. 1 agricultural cast	9.50	10.00
Stove plate	9.50	10.00
Grate bars	8.50	9.00
Brake shoes	8.50	9.00

*Relaying rails, including angle bars to match, are quoted f.o.b. dealers' yards.

NEW YORK

Pig Iron Melt at Low Point—Structural Is Feature of Steel Demand

NEW YORK, June 24.—Pig iron melt is at a low ebb and, with many foundries planning to take inventory next week, it will undergo a further decline. Sentiment, however, is not so uniformly pessimistic as recently. Here and there jobbing foundries report that their orders are picking up, and the improvement in their bookings in hand or in prospect has resulted in better demand for spot tonnages of iron. A single seller last week booked 600 tons for spot shipment. While this total is not large, it may be a straw pointing toward an increase in melt. The fact that a number of foundries have asked for earlier deliveries than had been specified on tonnages on order is also regarded as an encouraging omen.

Nothing resembling a third quarter buying movement has developed, but this is not surprising in view of the pronounced caution still prevalent throughout industry. The recent general downward trend of commodity prices is enough to prevent extended commitments, regardless of the state of the individual melter's business.

The Worthington Pump & Machinery Corporation, which was in the market for 1650 tons for various plants, has closed for only 400 or 500 tons and has deferred action on the remainder. The General Electric Co., which issued an inquiry for 1350 tons, has bought 500 tons and is revising specifications on the rest. A melter in this district is in the market for 1500 tons of foundry iron for July shipment. Another district user wants 800 tons of foundry and malleable. The New York Central Railroad is inquiring for 175 tons of foundry and 50 tons of charcoal for delivery at Frankfort, N. Y., or Elkhart, Ind.

Sales in this district, at 7000 tons, compare with 9000 tons in the previous week and 6000 tons two weeks ago.

Prices are substantially unchanged. Southern iron is still competitive, and it now appears that considerably more Alabama tonnage has been sold in this section in recent months than was currently reported.

Prices per gross ton, delivered New York district:

Buffalo No. 2 fdy., sil. 1.75 to 2.25	$20.91
*Buff. No. 2, del'd east. N. J.	19.28
East. Pa. No. 2 fdy., sil. 1.75 to 2.25	19.39
East. Pa. No. 2X fdy., sil. 2.25 to 2.75	19.89

Freight rates: $4.91 from Buffalo, $1.39 to $2.52 from eastern Pennsylvania.
*Prices delivered to New Jersey cities having rate of $3.28 a ton from Buffalo.

Reinforcing Bars.—The market is temporarily less active, but a number of sellers find that business volume so far this year has been about equal to that of the corresponding period in 1929. A number of large tonnages have been taken recently at sacrifice of price, but the trade is hopeful that the market will now show greater stability. Several subway contracts have been cancelled and new bids on revised specifications will be taken. Among these are contracts for subway route 108, section 6, and for route 103, section 3. In these latter cases elevated structures are to be built instead of subways. Several good-sized lots of reinforcing bars will be bought next month for the Hudson River bridge.

Concrete bars in 40, 50 and 60-ft. lengths for mill shipment are quoted at 1.75c. to 1.85c. a lb., base Pittsburgh. Warehouse prices range from 2.44c. a lb., f.o.b. cars, New York, for carloads or larger lots to 3.25c. for the smallest tonnages.

Finished Steel.—There is a fair degree of price steadiness in plates, shapes and bars, with the possible exception of reinforcing bars in the more desirable tonnages. On the ordinary run of business there is not so much pressure now for concessions, and the mills are hoping for the stabilization of the market at present levels for the third quarter. The list of sheet makers who have adopted third quarter minimum prices now embraces several mills, which name 2.55c., Pittsburgh, on black; 3.20c. on galvanized; 2c. on No. 10 blue annealed and 2.15c. on No. 13 blue annealed. While some current orders are being taken at concessions from these prices, immediate specification and shipment have been insisted upon, and it appears that a strong effort will be made in the coming quarter to steady the prices for the flat rolled products.

Developments in business, aside from some fair-sized awards and inquiries for structural steel, are not noteworthy. June business is below that of May, but in the past few weeks the orders received by most district sales offices have been running at a fairly even level. There will be a good many shutdowns of steel consuming plants during the early part of July, and the effect of these upon steel demands remains to be seen.

Warehouse Business. — Buying is still limited to small lots, but prices are fairly well maintained. Galvanized sheet prices continue to show slightly more firmness than a few weeks ago, and 4.25c. a lb., base, is shaded only on sizable orders.

Cast Iron Pipe.—Although buying is small and operations of Northern producers of pressure pipe are slightly reduced, the price is being held at $37 a ton, base, on most current business. Wethersfield, Conn., has awarded about 220 tons of water pipe for the Walcott Hill fire district to R. D. Wood & Co.

Prices per net ton deliv'd New York: Water pipe, 6-in. and larger, $39.90 to $40.90; 4-in. and 5-in., $42.90 to $43.90; 3-in., $49.90 to $50.90. Class A and gas pipe, $3 extra.

Coke.—Standard furnace coke is quoted at $2.50 to $2.60 a net ton, Connellsville, with distress carloads occasionally offered at about $2.40. Standard foundry coke is quiet and prices unchanged, as follows:

Special brands of beehive foundry coke, $4.85 a net ton, ovens, or $8.56 delivered to northern New Jersey, Jersey City and Newark, and $9.44 to New York and Brooklyn; by-product foundry coke, $9 to $9.40, Newark or Jersey City; $10.06, New York or Brooklyn.

Old Material. — Prices of most grades of scrap show a continued downward trend, with the exception of No. 1 heavy melting steel for eastern Pennsylvania delivery. Brokers completing heavy melting steel contracts with eastern Pennsylvania consumers are paying $9 a ton, New York, or $12.50, delivered, inasmuch as buyers for barge shipment from New York to Buffalo are still offering $10.50 on barge. Specification pipe is off 50c. a ton, with brokers

(*Concluded on page* 1936)

Warehouse Prices, f.o.b. New York

	Base per Lb.
Plates and structural shapes	3.30c.
Soft steel bars, small shapes	3.25c.
Iron bars	3.24c.
Iron bars, Swed. charcoal	7.00c. to 7.25c.
Cold-fin. shafting and screw stock—	
Rounds and hexagons	3.40c.
Flats and squares	3.90c.
Cold-roll. strip, soft and quarter hard	4.95c.
Hoops	4.25c.
Bands	3.75c.
Blue ann'l'd sheets (No. 10)	3.40c. to 3.60c.
Black sheets (No. 24*)	3.80c. to 4.00c.
Galvanized sheets (No. 24*)	4.25c. to 4.50c.
Long terne sheets (No. 24)	5.80c.
Standard tool steel	12.00c.
Wire, black annealed	4.50c.
Wire, galv. annealed	5.15c.
Tire steel, ½ x ½ in. and larger	3.40c.
Smooth finish, 1 to 2½ x ¼ in. and larger	3.75c.
Open-hearth spring steel, bases,	4.50c. to 7.00c.

*No. 28 and lighter, 36 in. wide, 20c. higher per 100 lb.

	Per Cent Off List
Machine bolts, cut thread:	
¾ x 6 in. and smaller	60
1 x 30 in. and smaller	50 to 50 and 10
Carriage bolts, cut thread:	
½ x 6 in. and smaller	60
¾ x 20 in. and smaller	50 to 50 and 10
Boiler Tubes—	Per 100 Ft.
Lap welded, 2-in.	$19.00
Seamless steel, 2-in.	20.25
Charcoal iron, 2-in.	26.25
Charcoal iron, 4-in.	67.00

Tin Plate (14 x 20 in.)

	Prime	Seconds
Coke, 100 lb. base box	$6.45	$6.20
Charcoal, per Box—	A	AAA
IC	$9.70	$12.10
IX	12.00	14.25
IXX	13.90	16.00

PHILADELPHIA

Steel Prices Lack Firmness—Mill Operations Unchanged

PHILADELPHIA, June 24.—Steel mill operations continue at 50 to 60 per cent of rated capacity, except for the leading independent interest in the East, which is operating at about 68 per cent. Prices lack firmness, and concessions on plates, shapes and bars are not uncommon when a desirable tonnage is offered. Shape mill operations have not appreciably improved, but, with fabricators bidding for a substantial tonnage of new construction work, additional tonnage on mill books is expected before long. Local consumers of sheets are inactive. The two leading radio manufacturers are slow in making preparations to enter into production scheduled for July. All grades of iron and steel scrap are weak, little pressure from buyers being required to obtain lower quotations.

Pig Iron.—The Baldwin Locomotive Works, Eddystone, Pa., is inquiring for 1000 to 1500 tons of floor grade iron. Recent contracts for this grade of iron have been placed by the Baldwin company with Southern makers. The movement of Birmingham pig iron into eastern Pennsylvania continues, with the price unchanged at $12.50 a ton, f.o.b. furnace, or $17.75, on cars, Philadelphia. Deliveries are being made on some substantial contracts with Delaware River cast iron pipe makers, but buying by small foundry consumers has declined, as their operating rates are at about 40 per cent of capacity. Sales of eastern Pennsylvania foundry iron are generally limited to lots of one or two carloads, on which $19 a ton, furnace, applies.

Prices per gross ton at Philadelphia:

East. Pa. No. 2, 1.75 to 2.25 sil.	$19.76
East. Pa. No. 2X, 2.25 to 2.75 sil.	20.26
East. Pa. No. 1X	20.76
Basic (del'd east. Pa.)	18.75 to 19.00
Malleable	21.25
Stand. low phos. (f.o.b. east. Pa. furnace)	24.00
Cop. b'r'g low phos. (f.o.b. furnace)	23.00 to 24.00
Va. No. 2 plain, 1.75 to 2.25 sil.	22.29
Va. No. 2X, 2.25 to 2.75 sil.	22.79

Prices, except as specified otherwise, are deliv'd Philadelphia. Freight rates: 76c. to $1.64 from eastern Pennsylvania furnaces; $4.54 from Virginia furnaces.

Bars.—The greater part of present business is being placed at 1.75c. a lb., Pittsburgh, or 2.04c., delivered Philadelphia, many orders being for less than a carload. On a substantial tonnage of bars, concessions are not uncommon and will range from $1 to $2 a ton, depending upon the size of the order.

Reinforcing Bars.—Projects in this district requiring reinforced concrete are generally small. Prices of reinforcing bars continue weak, with distributers quoting billet steel bars at 1.80c. to 1.85c. a lb., Pittsburgh, or 2.09c. to 2.14c., delivered Philadelphia. Rail steel bars range from 1.60c. to 1.65c., Franklin, Pa., or 1.89c. to 1.94c., delivered Philadelphia, with no extra for cutting to length or bending.

Shapes.—Mills are operating at 55 to 60 per cent of capacity, rolling schedules not yet having reflected the increased volume of business in projects requiring fabricated structural steel. Prices are still subject to shading, ordinary specifications being taken at 1.70c. to 1.80c. a lb., f.o.b. nearest mill to consumer, or 1.76c. to 1.86c., Philadelphia, and larger tonnages at concessions from 1.70c., mill.

Plates.—Concessions of $1 to $2 a ton from 1.80c. a lb., Coatesville, or 1.90½c., delivered Philadelphia, are not unusual, when a moderate-sized tonnage is offered. However, there is still a considerable number of orders being placed at 1.80c., Coatesville, as the majority of present purchasing is in decidedly small lots for prompt shipment.

Sheets.—Local consumers of sheets are generally operating at less than half capacity. The two leading radio manufacturers are not in production. Increased activity in the building trades, however, is being reflected in a small way among certain sheet users who manufacture household equipment such as stoves and refrigerators. Blue annealed sheet prices are unchanged at 2.15c. a lb., Pittsburgh, or 2.44c., delivered Philadelphia, for No. 13 gage, with $2 a ton concessions to preferred buyers. Blue annealed plates continue at 2c., Pittsburgh, or 2.29c., Philadelphia, for No. 10 gage, with $2 concessions to preferred buyers. While black sheets continue at 2.55c., Pittsburgh, or 2.84c., Philadelphia, on ordinary orders, a substantial purchase usually brings a concession of $1 a ton, and 2.50c., Pittsburgh, is being used as the base price for full-finished sheets. Galvanized sheets range from 3.15c. to 3.20c., Pittsburgh, or 3.44c. to 3.49c., Philadelphia.

Imports.—In the week ended June 21, 4700 tons of manganese ore arrived at this port from Brazil, 57 tons of ferrochrome from Switzerland, 500 tons of pig iron and 11 tons of steel scrap from the United Kingdom, 16 tons of steel rods and two tons of bearing tubing from Sweden.

Old Material.—Prices of all grades of scrap lack firmness, with consumer buying generally limited to small tonnages of material. Heavy breakable cast is off 50c. a ton, following purchase of about 1500 tons at $1.50 by a Coatesville, Pa., mill. Specification pipe is also off 50c. a ton, and other grades show a downward tendency.

Prices per gross ton delivered consumers' yards, Philadelphia district:

No. 1 heavy melting steel	$12.50 to $13.00
No. 2 heavy melting steel	10.50 to 11.00
Heavy melting steel (yard)	10.25 to 10.75
No. 1 railroad wrought	15.00 to 15.50
Bundled sheets (for steel works)	9.50
Hydraulic compressed, new	11.50 to 12.00
Hydraulic compressed, old	10.00
Machine shop turnings (for steel works)	9.00
Heavy axle turnings (or equiv.)	11.50 to 12.00
Cast borings (for steel works and roll. mill)	9.50
Heavy breakable cast (for steel works)	11.50 to 12.00
Railroad grate bars	10.00
Stove plate (for steel works)	10.00
No. 1 low phos., hvy., 0.04% and under	20.00
Couplers and knuckles	18.00 to 18.50
Rolled steel wheels	18.00 to 18.50
No. 1 blast f'nace scrap	8.50 to 9.00
Wrot. iron and soft steel pipes and tubes (new specific.)	12.00 to 12.50
Shafting	18.00 to 18.50
Steel axles	21.00 to 21.50
No. 1 forge fire	12.00
Cast iron carwheels	14.50 to 15.00
No. 1 cast	13.00 to 13.50
Cast borings (for chem. plant)	13.50 to 14.00
Steel rails for rolling	15.00 to 15.50

Warehouse Prices, f.o.b. Philadelphia

	Base per Lb.
Plates, ¼-in. and heavier	2.60c.
Structural shapes	2.60c.
Soft steel bars, small shapes, iron bars (except bands)	2.70c.
Reinforc. steel bars, sq., twisted and deform	2.60c. to 2.70c.
Cold-fin. steel, rounds and hex	3.40c.
Cold-fin. steel, sq. and flats	3.90c.
Steel hoops	3.25c.
Steel bands, No. 12 to ⅛-in. inclus.	3.00c.
Spring steel	5.00c.
*Black sheets (No. 24)	3.70c.
†Galvanized sheets (No. 24)	4.25c.
Light plates, blue annealed (No. 10)	3.15c.
Blue ann'l'd sheets (No. 13)	3.30c.
Diam. pat. floor plates, ¼-in.	5.30c.
Swedish iron bars	6.60c.

*For 50 bundles or more; 10 to 49 bun., 4.10c. base; 1 to 9 bun., 4.35c. base.
†For 50 bundles or more; 10 to 49 bun., 4.95c. base; 1 to 9 bun., 5.30c. base.

Further Decline in Steel Exports

WASHINGTON, June 24.—Exports of iron and steel products from the United States in May totaled 196,120 gross tons, a decline of 12,520 tons from April. Imports were 52,297 tons, a decrease of 353 tons from April.

Exports to Canada increased to 87,060 tons in May, from 75,665 tons in April. The great part of this gain resulted from increased shipments of scrap.

Exports of scrap in May were 40,051 tons; skelp, 15,695 tons; and plain shapes, 10,123 tons. May imports of structural shapes were 19,640 tons and of pig iron, 13,891 tons.

Exports made the lowest total since February, 1928. For five months the aggregate has been 1,065,608 tons, the lowest for that period since 1927.

CLEVELAND

Steel Business Declines Further and Ingot Output Is Down to 41 Per Cent

CLEVELAND, June 24.—Business in finished steel still shows a downward tendency, as demand from the automotive industry continues to decline. However, orders for steel bars from consumers outside of the automotive field gained somewhat during the week, and one leading producer of the heavier rolled steel products has entered 20 per cent more tonnage so far this month than during the corresponding period of May.

With the shutting down of two additional open-hearth furnaces this week, local steel production has been further reduced. Cleveland plants are now operating only 14 open-hearth furnaces, or 41 per cent of ingot capacity. Further decline in the demand for steel from automobile plants in the Michigan territory is expected in July because of the shutting down for two or more weeks by some of the motor car manufacturers.

The Ford Motor Co. has informed suppliers of material that its plant will be shut down from July 12 to 28 and it will discontinue receiving shipments of steel July 9. The Ford company is now producing about 8500 cars a day, as compared with its recent peak of close to 9000. The Chevrolet output for June is placed at 80,000 cars. The only change in the price situation is the decline of $1 a ton on steel bars for Cleveland delivery. Effort had been made recently to maintain a higher price for Cleveland buyers than for shipment to other parts of the territory. Most mills are willing to take on business for the coming quarter at present prices, but little effort is being made to close contracts.

Iron Ore.—The consumption of Lake ore during May amounted to 4,715,379 tons, an increase of 139,854 tons, as compared with April, as is shown by a monthly statement issued by the Lake Superior Iron Ore Association. This compares with 5,980,248 tons consumed in May, last year. Ore stocks at furnaces June 1 were 17,072,047 tons. The amount at furnaces and Lake Erie docks June 1 was 21,324,837 tons, as against 19,145,874 tons on the same date a year ago. Central district furnaces during May consumed 2,323,309 tons, an increase of 39,466 tons. Lake front furnaces used 2,217,411 tons, a gain of 127,394 tons. Eastern furnaces melted 80,115 tons, a loss of 26,262 tons, and all-rail furnaces consumed 94,544 tons, a loss of 744 tons. There were 157 furnaces using Lake ore in blast May 31, a decrease of five during the month.

Pig Iron. — Buyers are showing some interest in third quarter contracts, although inquiries for that delivery declined during the week. Sales by Cleveland interests aggregated 8000 tons the past week. One seller reports new inquiry for 10,000 tons. The Westinghouse Electric & Mfg. Co. has not yet made purchases against its recent inquiry for iron for Cleveland and Trafford City. The attitude of most consumers is to buy iron in small lots as needed. Conditions continue spotty in the jobbing foundry industry, with little change in the melt. Pig iron shipments are being maintained at about recent rates.

Prices are holding to recent quotations. Cleveland furnaces quote foundry and malleable iron at $18.50, furnace, for local delivery and $18 for outside shipment, not being inclined to seek business at competitive points where it would be necessary to shade these prices. Quotations in western Ohio and northern Indiana range from $18 to $18.50. In eastern Michigan, $19 is the ruling price, but $18.50 is prevailing in the western part of the State.

Prices per gross ton at Cleveland:

N'th'n fdy, sil. 1.75 to 2.25		$18.50
S'th'n fdy., sil. 1.75 to 2.25	$18.51 to	19.51
Malleable		18.50
Ohio silvery, 8 per cent	25.50 to	26.50
Basic Valley furnace		18.50
Stand. low phos., Valley	26.50 to	27.00

Prices are f.o.b. furnace except on Southern foundry and silvery iron. Freight rates: 50c. average local switching charge; $3 from Jackson, Ohio; $6.01 from Birmingham.

Strip Steel. — With little business coming from the automotive industry, demand for both hot and cold-rolled strip is at low ebb, and production has been further curtailed. Hot-rolled strip is generally quoted at 1.65c., Pittsburgh, for wide and 1.75c. for narrow for the larger buyers, but for small lots mills are adhering to 1.70c. for wide and 1.80c. for narrow. On cold-rolled strip 2.45c., Cleveland, is the ruling price except to small-lot buyers. Some of the mills have opened their books for the third quarter at the above named prices and at 3.80c., Cleveland, for fender stock, but consumers are showing no interest in contracts.

Warehouse Prices, f.o.b. Cleveland

	Base per Lb.
Plates and struc. shapes	3.00c.
Soft steel bars	3.00c.
Reinforc. steel bars	2.25c. to 2.50c.
Cold-fin. rounds and hex.	3.40c.
Cold-fin. flats and sq.	3.90c.
Hoops and bands, No. 12 to $\frac{1}{16}$ in., inclusive	3.25c.
Hoops and bands, No. 13 and lighter	3.65c.
Cold-finished strip	*5.95c.
Black sheets (No. 24)	3.75c.
Galvanized sheets (No. 24)	4.35c.
Blue ann'l'd sheets (No. 10)	3.25c.
No. 9 ann'l'd wire, per 100 lb.	$2.60
No. 9 galv. wire, per 100 lb.	3.05
Com. wire nails, base per keg	2.50

*Net base, including boxing and cutting to length.

Semi-Finished Steel.—Specifications for sheet bars are not holding up to recent volume, and demand for billets and slabs is very slow. Shipments are being made at $31, Cleveland and Youngstown, for the three products. Third quarter prices have not been named.

Bars, Plates and Shapes.—Orders for steel bars were better the past week than early in the month, owing to business coming from bolt and nut and rivet makers and miscellaneous consumers. Demand for plates from boiler and tank shops gained slightly. Structural shapes are quiet. Inquiry has come out for the Cleveland Stadium, requiring 4200 tons, for which bids will be received July 3. Steel bars for Cleveland delivery have declined $1 a ton to 1.75c. This recently has been the price for outside shipment, and concessions to 1.70c. for outside business are now reported. There have also been concessions to 1.70c., Pittsburgh, on steel bars for delivery in this territory. Some of the mills have started to close third quarter contracts.

The present 2.65c. base for alloy steel bars probably will be reestablished for the third quarter. This price is being well maintained on hot-rolled bars, but recently there has been some shading of ¼c. a lb. of the differential on cold-rolled alloy bars.

Sheets.—Orders from the automotive industry have further declined, and shipments to the local Chevrolet body plant were suspended this week because of a temporary shutdown due to plant extensions. Mills are getting a moderate volume of small-lot orders. Some effort is being made to stiffen black sheets to 2.55c, Pittsburgh, although some mills still seem willing to go to 2.45c. for attractive lots. While 3.60c. is quoted on auto body sheets to large buyers, some of the mills are asking 3.70c. for small lots. On metal furniture sheets, 3.70c. has become the more common price and is being named for third quarter. Mills generally will take third quarter business at the prevailing quotations, which are about $10 a ton lower than the prices named for the third quarter last year except on blue annealed sheets.

Reinforcing Bars.—The Cleveland warehouse of the General Electric Co. probably will be built of reinforced concrete instead of steel, as was originally planned and as previously reported awarded to a fabricator. It will require about 8000 tons of bars. The administration building of the

(*Concluded on page* 1936)

CINCINNATI

Pig Iron Buyers Extremely Conservative—Scrap Prices Steadier

CINCINNATI, June 24.—Melters in this area have adopted a policy of extreme conservatism, permitting virtually no inventories to accumulate. The price situation is unchanged, with Northern iron holding at recent schedules, and Southern weak at $13, base Birmingham. Transactions in the last week totaled about 2500 tons, with one sizable order for 200 tons of Southern iron from a northern Ohio consumer. About 2000 tons, reported last week as an inquiry, went to a Lake furnace.

Prices per gross ton, deliv'd Cincinnati:

So. Ohio fdy., sil. 1.75 to 2.25	$20.89 to $21.39
Ala. fdy., sil. 1.75 to 2.25	16.69 to 17.69
Ala. fdy., sil. 2.25 to 2.75	17.19 to 18.19
Tenn. fdy., sil. 1.75 to 2.25	17.19 to 17.69
S'th'n Ohio silvery, 8 per cent	26.89

Freight rates, $1.89 from Ironton and Jackson, Ohio; $3.69 from Birmingham.

Coke.—June specifications are below the level of May.

Finished Material.—District sheet mills report a slight improvement in the demand for sheets. Incoming tonnage, which has been between 40 and 45 per cent of capacity, increased to 50 per cent last week. Production, however, is still at about 40 per cent with mills depending on current bookings to sustain operations. June shipments to radio manufacturers are greater than those of any month this year, but demand from this field still indicates less than capacity production.

Old Material.—The continued firmness of dealers' prices on scrap is the sole feature of this market. New business is virtually negligible.

Warehouse Prices, f.o.b. Cincinnati

	Base per Lb.
Plates and struc. shapes	3.40c.
Bars, soft steel or iron	3.30c.
New billet reinforc. bars	3.30c.
Rail steel reinforc. bars	3.15c.
Hoops	4.05c.
Bands	3.50c.
Cold-fin rounds and hex	3.80c.
Squares	4.30c.
Black sheets (No. 24)	4.05c.
Galvanized sheets (No. 24)	4.90c.
Blue ann'l'd sheets (No. 10)	3.45c.
Structural rivets	4.20c.
Small rivets	60 per cent off list
No. 9 ann'l'd wire, per 100 lb	$3.00
Com. wire nails, base per keg (25 kegs or more)	2.95
Cement c't'd nails, base 100 lb. keg	2.95
Chain, per 100 lb	10.25
	Net per 100 Ft.
Lap-welded steel boiler tubes, 2-in.	$16.50
4-in.	34.50
Seamless steel boiler tubes, 2-in.	17.50
4-in.	36.00

Dealers' buying prices per gross ton, f.o.b. cars, Cincinnati:

Heavy melting steel	$11.00 to $11.50
Scrap rails for melting	11.75 to 12.25
Loose sheet clippings	8.00 to 8.50
Bundled sheets	10.00 to 10.50
Cast iron borings	8.00 to 8.50
Machine shop turnings	7.50 to 8.00
No. 1 busheling	9.50 to 10.00
No. 2 busheling	6.00 to 6.50
Rails for rolling	13.00 to 13.50
No. 1 locomotive tires	13.50 to 14.00
No. 2 railroad wrought	11.00 to 11.50
Short rails	17.00 to 17.50
Cast iron carwheels	12.00 to 12.50
No. 1 machinery cast	17.50 to 18.00
No. 1 railroad cast	14.50 to 15.00
Burnt cast	8.25 to 8.75
Stove plate	8.25 to 8.75
Brake shoes	8.25 to 8.75
Agricultural malleable	14.00 to 14.50
Railroad malleable	15.00 to 15.50

BOSTON

Pig Iron Buying Almost Stagnant—Scrap Prices Unsettled and Easier

BOSTON, June 24.—Pig iron buying is almost stagnant, sales the past week totaling not more than 800 tons. The current New England melt is about 20 per cent of the rated capacity. A Springfield, Mass., foundry, however, is sounding out the market on a round tonnage, and a Connecticut foundry is seeking a tonnage of malleable iron, but otherwise prospective business is almost negligible. Buffalo No. 2X iron is available at $16 a ton, furnace, and east of Buffalo iron at the equivalent or less.

Foundry iron prices per gross ton deliv'd to most New England points:

†Buffalo, sil. 1.75 to 2.25	$20.28 to $21.28
†Buffalo, sil. 2.25 to 2.75	20.78 to 21.78
*Buffalo, sil. 1.75 to 2.25	20.91 to 21.91
*Buffalo, sil. 2.25 to 2.75	21.41 to 22.41
Va., sil. 1.75 to 2.25	25.21
Va., sil. 2.25 to 2.75	25.71
*Ala., sil. 1.75 to 2.25	22.61
*Ala., sil. 2.25 to 2.75	23.11
†Ala., sil. 1.75 to 2.25	18.75
†Ala., sil. 2.25 to 2.75	19.25

Freight rates: $4.91 all rail and $4.28 rail and water from Buffalo; $5.21 all rail from Virginia; $9.61 all rail from Alabama and $5.75 rail and water from Alabama to New England seaboard.

*All rail rate.

†Rail and water rate.

Reinforcing Bars.—Because of the recent adjustment of freight rates on steel bars, prices of billet steel bars have been advanced 0.08½c. a lb. from stock in Boston. The trade now quotes from stock as follows: One to 5 ton lots, 3.15c. a lb., base; six to 99 ton lots, 2.65c.; 100-ton lots and larger, 2.55c. Bids will be submitted this week on 2000 tons of 1¼-in. reinforcing bars for the Boston Post Office, the largest job that has come into the market in many months. It is understood that rail steel as well as billet steel bars will be accepted, consequently keen competition for the tonnage is expected. Prices quoted openly on rail steel bars remain unchanged at 2.26½c. a lb., base, delivered Boston freight rate points.

Old Material.—Most brokers will not pay more than $9 a ton, on cars shipping point, for heavy melting steel, and at least one has dropped his price to $8.85, so the market unquestionably is easier. A Worcester, Mass., mill bought a few cars of long bundled skeleton at $8.50 a ton, delivered, equivalent to $6.10, on cars here, while some brokers are offering $7, on cars, for Pennsylvania consumption. An eastern Pennsylvania mill took mixed borings and turnings at $7.80 a ton, delivered, equivalent to a little more than $4 on cars here, whereas two weeks ago the market was generally under $4. A New England consumer will not pay more than $5.75 a ton, delivered, for mixed borings and turnings and not more than $7.75, delivered, for stove plate, while $5.60 on cars here was paid for stove plate, Pennsylvania delivery. It is apparent, therefore, that scrap prices are quite unsettled, and generally easier than a week ago.

Buying prices per gross ton, f.o.b. Boston rate shipping points:

No. 1 heavy melting steel	$8.85 to $9.00
Scrap T rails	8.50 to 8.85
Scrap girder rails	7.75 to 7.85
No. 1 railroad wrought	8.10 to 8.50
Machine shop turnings	4.00 to 4.35
Cast iron borings (steel works and rolling mill)	4.00 to 4.35
Bundled skeleton, long	6.10 to 7.00
Forge flashings	7.25 to 7.75
Blast furnace borings and turnings	4.00 to 4.10
Forge scrap	6.60 to 7.10
Shafting	14.00 to 14.50
Steel car axles	14.50 to 15.50
Wrought pipe, 1 in. in diameter (over 2 ft. long)	7.00 to 7.50
Rails for rolling	9.00 to 9.25
Cast iron borings, chemical	9.00 to 9.50

Prices per gross ton deliv'd consumers' yards:

Textile cast	$11.50 to $12.00
No. 1 machinery cast	14.00 to 14.50
No. 2 machinery cast	11.00 to 12.00
Stove plate	7.75 to 9.50
Railroad malleable	15.00 to 15.50

Cast Iron Pipe.—R. D. Wood & Co. were the low bidder on 1500 tons of 6 to 20-in. pipe required by Southboro, Mass. Providence, R. I., has purchased 350 tons of cement-lined pipe from the United States Pipe & Foundry Co., and Lynn, Mass., 150 tons from the Warren Foundry & Pipe Co. In addition, numerous small tonnages in the aggregate amounted to 600 tons. New Haven, Conn., is in the market for 300 tons of

Warehouse Prices, f.o.b. Boston

	Base per Lb.
Plates	3.365c.
Structural shapes—	
Angles and beams	3.365c.
Tees	3.365c.
Zees	3.465c.
Soft steel bars, small shapes	3.265c.
Flats, hot-rolled	4.15c.
Reinforcing bars	3.265c. to 3.54c.
Iron bars—	
Refined	3.265c.
Best refined	4.60c.
Norway rounds	6.60c.
Norway squares and flats	7.10c.
Spring steel—	
Open-hearth	5.00c. to 10.00c.
Crucible	12.00c.
Tie steel	4.50c. to 4.75c.
Bands	4.015c. to 5.00c.
Hoop steel	5.50c. to 6.00c.
Cold-rolled steel—	
Rounds and hex	*3.55c. to 5.55c.
Squares and flats	*4.05c. to 7.05c.
Toe calk steel	6.00c.
Rivets, structural or boiler	4.50c.
	Per Cent Off List
Machine bolts	50 and 5
Carriage bolts	50 and 5
Lag screws	50 and 5
Hot-pressed nuts	50 and 5
Cold-punched nuts	50 and 5
Stove bolts	70 and 10

*Including quantity differentials.

30 and 48-in. pipe, and Lowell, Mass., for 115 tons of 10 and 12-in. New London, Conn., has yet to cover on 100 tons of 12-in. Foundries in general are securing $37 a ton, foundry, for 6-in. and larger pipe on private business, but on competitive tonnages less than $36 has been accepted. A differential of $3 to $4 a ton is asked on Class A and gas pipe.

PACIFIC COAST

Awards of Cast Iron Pipe, Plates and Structural Steel Increase

SAN FRANCISCO, June 21 (*By Air Mail*). — While demand is by no means active, awards of cast iron pipe, plates and structural steel shapes were the heaviest in more than eight weeks. Outstanding lettings included 1200 tons of plates for a pipe line at Tacoma, Wash., booked by the Birchfield Boiler Works, and 615 tons of structural shapes for a bridge at Bradley, Cal., secured by the United States Steel Products Co. The price situation reflects the weakness in Eastern markets.

Reinforcing steel bar awards exceeded 750 tons. The Blue Diamond Co. took 200 tons for the Hall of Justice, Pasadena, and an unnamed interest booked 350 tons for a bridge over the Salinas River at Bradley, Cal. Pending business is not of heavy proportions. Los Angeles has opened bids on 193 tons, and 260 tons is involved in the Rose Bowl addition at Pasadena. Out-of-stock prices in the San Francisco district continue unchanged at 2.30c., base, on carload lots. Los Angeles prices are holding at 2.40c. Merchant bar steel is moving in comparatively small lots. Prices on this class of material are firm at 2.35c., c.i.f.

A number of projects, calling for 100 to 1200 tons of plates, were reported placed. The Western Pipe & Steel Co. secured 300 tons for 20-in. welded steel pipe for Los Angeles. The Steel Tank & Pipe Co. booked 200 tons for pipe and several tanks for the Parr-Richmond Terminal Corporation, Richmond, Cal. Seattle, it is reported, will shortly come into the market for 6000 to 10,000 tons for a pipe line. Prices are holding fairly well at 2.25c., c.i.f.

Among structural awards of the week were 500 tons for a chemical plant for the Shell Oil Co. near Bay Point, Cal., booked by the Judson-Pacific Co., and 330 tons for two apartment buildings in San Francisco, taken by the McClintic-Marshall Co. The largest new inquiry involves 168 tons for a bridge over the Trinity River in California. In addition to the larger projects placed, a number of small lettings, involving from 30 to 60 tons, were reported. Shapes remain firm at 2.35c., c.i.f.

Pig Iron.—Prices are unchanged.

Prices per gross ton at San Francisco:

*Utah basic	$25.00 to $26.00
*Utah fdy., sil. 2.75 to 3.25	25.00 to 26.00
**Indian fdy., sil. 2.75 to 3.25	25.00 to 26.00

*Delivered San Francisco.
**Duty paid, f.o.b. cars San Francisco.

Warehouse Prices, f.o.b. San Francisco

	Base per Lb.
Plates and struc. shapes	2.45c. to 2.95c.
Soft steel bars	2.40c. to 2.95c.
Black sheets (No. 24)	3.65c. to 4.30c.
Blue ann'l'd sheets (No. 10)	3.05c. to 3.55c.
Galv. sheets (No. 24)	4.30c. to 4.80c.
Struc. rivets, ½-in. and larger	5.65c.
Com. wire nails, base per keg	$3.40
Cement c't'd nails, 100 lb. keg	3.40

Steel Pipe. — Standard steel pipe continues to move in relatively small lots. Los Angeles opened bids on 160 tons of ¾ to 2-in. extra heavy wought iron pipe. No large pipe line inquiries are current.

Sheets. — Sheet prices are by no means firm at 2.75c., c.i.f., on No. 10 gage blue annealed, 3.35c., on No. 24 gage black sheets and at 4c., on No. 24 gage galvanized sheets. The Navy Department recently placed two lots of 125 tons and 425 tons for the Mare Island Navy Yard with unnamed interests.

Cast Iron Pipe.—Sales of cast iron pipe have increased considerably during the past 10 days. Awards this week exceeded 3000 tons, of which about 2700 tons was taken by the city of Los Angeles, divided as follows: 363 tons of 20-in. pipe to United States Pipe & Foundry Co. and an equal amount to the Pacific States Cast Iron Pipe Co.; 102 tons of 24-in. pipe to the Grinnell Co.; 335 tons of 16 and 20-in. pipe to the National Cast Iron Pipe Co.; 1375 tons of 12 and 24-in. to American Cast Iron Pipe Co., and 164 tons of 6 and 10-in. to an unnamed bidder. The Drainage Construction Co. was awarded 350 tons of 4 to 8-in. for Santa Ana, Cal. Olympia, Wash., has opened bids on 913 tons of 10 to 16-in. pipe, and Fullerton, Cal., has taken bids on 831 tons of 8 and 12-in. Bids have also been opened on 153 tons of 6 and 8-in. for Long Beach, Cal.

BIRMINGHAM

Furnaces Open Books for Third Quarter — Ensley Rail Mill Idle

BIRMINGHAM, June 24.—Books were opened June 21 for third quarter pig iron at $14, the price that has been in effect throughout the second quarter for district sales. Partly because of the large amount of iron due consumers on second quarter contracts, the interest in the new quarter has been unusually light. The fact that more consumers than usual have adopted the policy of buying as needed is also expected to influence the character of third quarter business. Shipments are moving at a steady rate, the volume being favorable, considering conditions.

Furnace operations are unchanged. Of the 16 that are active, seven are on foundry iron, seven on basic, one on recarburizing iron and one on ferromanganese.

Prices per gross ton, f.o.b. Birmingham dist. furnaces:

No. 2 fdy., 1.75 to 2.25 sil	$14.00
No. 1 fdy., 2.25 to 2.75 sil	14.50
Basic	14.00

Finished Steel.—The rail mill at Ensley was shut down last week. Unless further orders are received, it is to remain idle for a few weeks pending later specifications on remaining portions of old contracts. Some minor reductions have been made in operations at other finishing mills while needed repairs are being made.

Bookings hardly held their own last week, the aggregate being about the lightest for any week this month. Demand for structural shapes and bars is still weak for this season, as is demand for wire products for warehouse stocking purposes. Quotations are unchanged, though the possibility of concessions on large orders is still present.

Orders for fabricated structural steel were a little better last week, and a few new tonnages were added to the large, but indefinite, pending list.

Active open-hearths have been reduced from 18 to 14. The Tennessee company is working four of nine at Ensley and six of eight at Fairfield. The Gulf States Steel Co. continues to average four of six at Alabama City.

Cast Iron Pipe. — Pressure pipe bookings last week were above the recent average. About 3000 tons for Los Angeles was divided among plants here. The United States Pipe & Foundry Co. has booked upward of 1500 tons of 10 to 24-in. pipe for Asheville, N. C., and 11,470 ft. of 6-in. pipe for Gulfport, Miss. Pipe will be bought in this district for a 4000-ton project at Dallas, Tex., awarded last week to the J. B. McCrary Co., of Atlanta. New inquiries indicate a scattering of light municipal tonnages for the near future.

One company has made further reductions in operations, of a minor nature, and is now operating at about 50 per cent of capacity. Some of the others are still operating at as high

as 65 per cent of capacity. Prices remain at $37 to $38 a ton, Birmingham.

Coke.—Forward buying of foundry coke is not so heavy as usual at the beginning of a second half year. The movement of coke is below that of this period last year, but slightly better than in 1928. Both prices and operations are without change.

Old Material.—Consumers show no interest in the market. Recent low prices have encouraged dealers to build up stocks, but this is not so with consumers. Quotations are unchanged.

Prices per gross ton deliv'd Birmingham dist. consumers' yards:

Heavy melting steel	$12.00
Scrap steel rails	$12.50 to 13.00
Short shoveling turnings	9.00
Cast iron borings	9.00
Stove plate	11.50 to 12.00
Steel axles	20.00
Iron axles	23.00
No. 1 railroad wrought	10.00 to 10.50
Rails for rolling	14.50
No. 1 cast	13.00
Tramcar wheels	12.50
Cast iron carwheels	13.00 to 13.50
Cast iron borings, chem.	13.50 to 14.00

ST. LOUIS

Pig Iron Reduced 50c a Ton—Railroad Steel Buying Gain Expected

ST. LOUIS, June 24.—While the pig iron trade continues quiet, there is said to be a better feeling among the makers and melters, who look for an improvement in buying shortly. Stocks in hands of melters are said to be low, and this is emphasized by the demand for quick shipment of that which is ordered. The St. Louis Gas & Coke Corporation is now quoting $18.50 to $19, f.o.b. Granite City, its previous quotation having been $19. The principal sale of the week was 1700 tons of Northern foundry iron and 325 tons of silvery iron to an Illinois tractor manufacturer.

Prices per gross ton at St. Louis:

No. 2 fdy., sil. 1.75 to 2.25 f.o.b. Granite City, Ill.	$18.50 to $19.00
Malleable, f.o.b. Granite City	18.50 to 19.00
N'th'n No. 2 fdy., deliv'd St. Louis	20.16
Southern No. 2 fdy., deliv'd	17.42
Northern malleable, deliv'd	20.16
Northern basic, deliv'd	20.16

Freight rates: 75c. (average) Granite City to St. Louis; $2.16 from Chicago; $4.42 from Birmingham.

Finished Steel.—Railroads have asked for prices on their third quarter requirements of plates, shapes, bars and sheets. Because specifications have been extremely light in recent months, heavier buying of these items by roads is expected during the coming quarter. For some time the roads are said to have been moving material from one store to another rather than buy additional supplies. Buying of the items named in other lines has been quiet. Warehouse business shows further improvement over that of May, and jobbers look for even better things in such shipments. The structural trade is very quiet.

Old Material.—The scrap market continues weak, with prices generally unchanged. Prices are mostly nominal, as there is not sufficient trading to establish definite quotations. Mills say they will not buy material until they have larger order files. Dealers are not laying down scrap, believing prices are still not attractive for that. The result is that scrap is being shipped to other markets. Agricultural malleable is 50c. lower.

Railroad lists follow: New York, Chicago & St. Louis, 43 carloads; Chicago Great Western 25 carloads; St. Louis-San Francisco, 21 carloads; Chicago & Eastern Illinois, 15 carloads; and Chicago Belt Railway, 10 carloads.

Dealers' buying prices per gross ton, f.o.b. St. Louis district:

Selected heavy melting steel	$11.50 to $12.00
No. 1 heavy melting or shoveling steel	10.75 to 11.25
No. 2 heavy melting or shoveling steel	10.00 to 10.50
No. 1 locomotive tires	13.00 to 13.50
Misc. stand.-sec. rails including frogs, switches and guards, cut apart	11.50 to 12.00
Railroad springs	13.75 to 14.25
Bundled sheets	7.50 to 8.00
No. 2 railroad wrought	10.75 to 11.25
No. 1 busheling	9.75 to 10.25
Cast iron borings and shoveling turnings	9.25 to 9.50
Iron rails	11.00 to 11.50
Rails for rolling	12.50 to 13.00
Machine shop turnings	6.00 to 6.50
Heavy turnings	8.50 to 9.00
Steel car axles	15.50 to 16.00
Iron car axles	25.50 to 26.00
Wrot. iron bars and trans.	16.00 to 16.50
No. 1 railroad wrought	8.50 to 9.00
Steel rails, less than 3 ft.	13.50 to 14.00
Steel angle bars	10.25 to 10.75
Cast iron carwheels	12.50 to 13.00
No. 1 machinery cast	12.75 to 13.25
Railroad malleable	11.50 to 12.00
No. 1 railroad cast	11.50 to 12.00
Stove plate	10.00 to 10.50
Relay. rails, 60 lb. and under	20.50 to 23.50
Relay. rails, 70 lb. and over	26.50 to 29.00
Agricult. malleable	10.50 to 11.00

Warehouse Prices, f.o.b. St. Louis

	Base per Lb.
Plates and struc. shapes	3.25c.
Bars, soft steel or iron	3.15c.
Cold-fin. rounds, shafting, screw stock	3.60c.
Black sheets (No. 24)	4.25c.
Galv. sheets (No. 24)	4.85c.
Blue ann'l'd sheets (No. 10)	3.45c.
Black corrug. sheets (No. 24)	4.30c.
Galv. corrug. sheets	4.90c.
Structural rivets	4.15c.
Boiler rivets	4.15c.
	Per Cent Off List
Tank rivets, ⅞-in. and smaller, 100 lb. or more	65
Less than 100 lb	60
Machine bolts	60
Carriage bolts	60
Lag screws	60
Hot-pressed nuts, sq., blank or tapped, 200 lb. or more	60
Less than 200 lb	50
Hot-pressed nuts, hex., blank or tapped, 200 lb. or more	60
Less than 200 lb	50

G. H. Williams Co., Erie, Pa., manufacturer of buckets and trailers, has appointed Kratz & McClelland, San Francisco, as agents for northern California.

Canada

Wide Reductions in Some Grades of Scrap

TORONTO, June 24.—With the exception of more extensive forward delivery commitments, business in the Canadian pig iron markets shows very little change. Prices are unchanged.

Structural Steel.—Fabricators are busy and have large unfilled tonnages on their books. Prospective demands involve large tonnages, but in most instances there is no rush to cover. Small tonnage buying is fairly extensive in most sections of the Dominion.

Prices per gross ton:

Delivered Toronto	
No. 1 fdy., sil. 2.25 to 2.75	$22.60
No. 2 fdy., sil. 1.75 to 2.25	22.10
Malleable	22.60
Delivered Montreal	
No. 1 fdy., sil. 2.25 to 2.75	$24.00
No. 2 fdy., sil. 1.75 to 2.25	23.50
Malleable	24.00
Basic	22.50
Imported Iron, Montreal Warehouse	
Summerlee	$33.50
Carron	33.00

Old Material.—The demand for iron and steel scrap has fallen to a state bordering on stagnation. Consumers are showing listless interest and are ordering chiefly for immediate needs. Small tonnage sales of heavy melting steel and turnings are reported from the Hamilton district, but there are no large contracts.

Toronto and Montreal dealers have revised their price lists, with cuts in quotations ranging from 50c. to $4 a ton. While no change was made in the buying prices for heavy melting steel, boiler plate and wrought scrap by Toronto dealers, practically all other lines were graded downward. No 1 machinery cast is now being purchased at $11, as against a former price of $15; standard car wheels were cut $4; malleable scrap and stove plate were each reduced $2 in the local market. Steel axles, which were formerly quoted at $14, have been reduced to $10, and dealers are now offering $10 for rails, delivered Toronto. Montreal prices show corresponding reductions.

Dealers' buying prices:

Per Gross Ton

	Toronto	Montreal
Heavy melting steel	$9.00	$8.00
Rails, scrap	10.00	8.00
No. 1 wrought	9.00	11.00
Machine shop turnings	6.00	5.00
Boiler plate	7.00	6.50
Heavy axle turnings	7.00	6.00
Cast borings	6.50	5.00
Steel borings	6.50	6.00
Wrought pipe	4.00	4.00
Steel axles	10.00	13.00
Axles, wrought iron	12.00	15.00
No. 1 machinery cast	....	12.00
Stove plate	....	10.00
Standard carwheels	....	10.50
Malleable	....	10.00
Per Net Ton		
No. 1 mach'ry cast	11.00	....
Stove plate	9.00	....
Standard carwheels	10.00	....
Malleable scrap	9.00	....

BUFFALO

Pig Iron and Scrap Dull—Bethlehem Operating 19 of 24 Open-Hearths

BUFFALO, June 24. — Business is very quiet in the local pig iron market, with aggregate bookings of 4000 to 5000 tons in the past week. Some of the larger inquiries which were mentioned last week have been cut down. The Worthington inquiry for 1200 tons of foundry, Bessemer and high silicon iron has been reduced to immediate requirements, and others have been treated the same way. An inquiry for 800 tons of foundry and malleable, about evenly divided, comes from Bridgeport. An Eastern malleable concern is inquiring for 1200 tons of malleable.

Prices per gross ton f.o.b. furnace:

No. 2 fdy., sil. 1.75 to 2.25	$18.50
No. 2X fdy., sil. 2.25 to 2.75	19.00
No. 1 fdy., sil. 2.75 to 3.25	20.00
Malleable, sil. up to 2.25	19.00
Basic	17.50
Lake Superior charcoal	27.28

Finished Steel. — The Lackawanna plant of the Bethlehem Steel Co. is operating 19 open-hearths of 24—three less than last week. The Republic plant is operating four open-hearths. Structural awards are at a minimum.

Old Material.—A sale of about 3000 tons of No. 1 heavy melting steel and No. 1 busheling is reported at $13.85 for the No. 1 steel and $12.85 for the busheling. A tonnage of cast iron borings was sold at $10.25. An inquiry for 1800 tons of No. 1 machinery cast has been reduced to 500 tons. These are the only important developments in a market which is unusually dull. Production of scrap in the territory has been dropping off rapidly for weeks.

Prices per gross ton f.o.b. Buffalo consumers' plants:

Basic Open-Hearth Grades:		
No. 1 heavy melting steel	$13.00 to	$13.50
No. 2 heavy melting scrap		11.50
Scrap rails	12.00 to	12.50
Hydraulic comp. sheets	11.50 to	12.00
Hand bundled sheets	9.00 to	9.50
Drop forge flashings	11.25 to	11.75
No. 1 busheling	11.75 to	12.75
Hvy. steel axle turnings	11.50 to	12.00
Machine shop turnings	8.00 to	8.50
No. 1 railroad wrought	10.50 to	11.00
Acid Open-Hearth Grades:		
Knuckles and couplers	15.00 to	15.50
Coil and leaf springs	15.00 to	15.50
Rolled steel wheels	15.00 to	15.50
Low phos. billet and bloom ends	17.00 to	17.50
Electric Furnace Grades:		
Short shov. steel turnings	10.75 to	11.00
Blast Furnace Grades:		
Short mixed borings and turnings	9.50 to	10.00
Cast iron borings	9.50 to	10.00
No. 2 busheling		7.00
Rolling Mill Grades:		
Steel car axles	16.50 to	17.00
Iron axles	19.50 to	20.00
Cupola Grades:		
No. 1 machinery cast	12.00 to	12.50
Stove plate	10.75 to	11.00
Locomotive grate bars	9.00 to	9.50
Steel rails, 3 ft. and under	16.00 to	16.50
Cast iron carwheels	13.50 to	14.00
Malleable Grades:		
Industrial	15.50 to	16.00
Railroad	15.50 to	16.00
Agricultural	15.50 to	16.00
Special Grades:		
Chemical borings	11.50 to	12.00

Warehouse Prices, f.o.b. Buffalo

	Base per Lb.
Plates and struc. shapes	3.40c.
Soft steel bars	3.30c.
Reinforcing bars	2.95c.
Cold-fin. flats and sq	3.65c.
Rounds and hex	3.15c.
Cold-rolled strip steel	5.85c.
Black sheets (No. 24)	4.20c.
Galv. sheets (No. 24)	4.85c.
Blue ann'l'd sheets (No. 10)	3.50c.
Com. wire nails, base per keg	$3.20
Black wire, base per 100 lb	3.50

Detroit Scrap Believed to Be at Bottom

DETROIT, June 24.—The only change in the scrap market in the district during the past week was a decline of 50c. a ton on long turnings. The general feeling is that prices are about at bottom and that, with the curtailing of automobile production in July, current orders will be sufficient to cover material being released.

Dealers' buying prices per gross ton, f.o.b. cars, Detroit:

Hvy. melting and shov. steel	$11.00 to $11.50
Borings and short turnings	7.25 to 7.75
Long turnings	6.00 to 6.50
No. 1 machinery cast	11.25 to 11.75
Automotive cast	13.50 to 14.00
Hydraul. comp. sheets	10.50 to 11.00
Stove plate	9.00 to 9.50
New No. 1 busheling	9.75 to 10.25
Old No. 1 busheling	8.75 to 9.25
Sheet clippings	8.00 to 8.50
Flashings	9.75 to 10.25

Cleveland Company to Electrify Soviet Plant

The Hatfield Electric Co., Cleveland, has been awarded a contract for designing and the supervision of the construction of the electrical equipment which will be installed in the steel plant that will be erected at Magnitogorsk, Russia. Contract for the steel plant was recently placed with Arthur G. McKee & Co., Cleveland. The Hatfield company's contract will include electrification of mining and ore-handling equipment.

"Timing" of Public Works Stressed in Report

Stressing the importance of "timing" with reference to the amount of public construction which it is possible to push forward with the object of influencing employment and the trend of business in a period of recession, the Committee on Recent Economic Changes of the President's Conference on Unemployment, in presenting the results of a new study entitled "Planning and Control of Public Works," points to the fact that contracts awarded for public works and utilities in the first four months of 1930 showed an increase of 30 per cent over the corresponding period in 1929. "And it is in promptly and comprehensively expediting work on projects already planned, rather than initiating new undertakings, that the key to the problem lies."

The report announces that it is planning a "further exploration" of varying interest rates or capital costs upon the chief types of construction, and that it is also undertaking an examination of that fundamental incentive, the "lure of profits," as manifested during the past ten years of American economic life. The report also refers to the committee's study of price relationships now in progress, concerning which it remarks: "Like the present report, it will take its place in the step-by-step analysis which the committee is making, in the hope that with better and more general understanding of economic forces, and the laws of their operation, American business may develop increasing self-control."

It is pointed out in the report that about $3,500,000,000 is expended annually on public construction, employing approximately 900,000 workers, and that the trend is rising. These public expenditures represent, it is estimated, from 35 to 40 per cent of the total of all construction in the country.

Columbia Steel Co. Formed as U. S. Steel Subsidiary

The properties, assets and business of the Columbia department of the United States Steel Products Co., subsidiary of the United States Steel Corporation, were on Tuesday acquired by the Columbia Steel Co., a Delaware corporation, also a subsidiary of the United States Steel Corporation. Effective July 1, 1930, the business heretofore conducted by the Columbia department of the United States Steel Products Co., which includes the operation of the properties of the former Columbia Steel Corporation acquired by the United States Steel Corporation last January, as well as the distribution on the Pacific Coast of the products of the other manufacturing subsidiaries of the United States Steel Corporation, will be conducted by Columbia Steel Co.

The executive officers of the Columbia Steel Co. are: A. T. DeForest, president; L. F. Rains, vice-president; W. A. Ross, vice-president and treasurer; H. F. Wilson, secretary and auditor; all with offices in the Russ Building, San Francisco.

Properties of Alloy and Other Rail Steels

"Endurance Properties of Some Special Rail Steels," is the title of Research Paper No. 182 of the Bureau of Standards. It is a reprint from the bureau's journal of research and the authors are John R. Freeman, Jr., and R. D. France. The materials studied are medium-manganese rails, heat-treated rails, manganese-molybdenum rails and zirconium-treated medium-manganese rails.

Government Sues Steel Corporation Road

Seeks to Force Surrender of Elgin, Joliet & Eastern as Violating Interstate Commerce Act

WASHINGTON, June 24. — American steel companies would be compelled to surrender interstate rail lines they own and operate if the Government should win a suit it has instituted in the Federal Court at Chicago against the Elgin, Joliet & Eastern Railroad, subsidiary of the United States Steel Corporation. That would be the sweeping effect of a Government victory, according to interpretation here of the proceeding. These lines represent hundreds of millions of dollars in investment.

It is claimed that if the steel companies were forced to sever ownership connection with the rail lines there would be a marked transformation in competitive conditions in the iron and steel industry. The assertion grows out of the contention that one great advantage of steel companies owning railroads over competitors lies in transportation facilities.

The suit was entered at Chicago last Thursday by the Department of Justice through George E. Q. Johnson, district attorney, at the direction of Attorney General William D. Mitchell, who is said to have acted upon the recommendation of the Interstate Commerce Commission. Besides Mr. Johnson and the Attorney General, others who joined in the petition are John Lord O'Brian, assistant to the Attorney General; Elmer B. Collins, special assistant to the Attorney General, and Burt L. Smelker, attorney for the commission.

The petition asks for a writ of mandamus. It charges violation of the commodities clause of the Interstate Commerce Act. It is sought to restrain the Elgin, Joliet & Eastern from transporting in interstate commerce products manufactured, mined or produced by it or by any corporation of which it may be a subsidiary. The only products excluded under this clause are lumber and its manufactures, and these products have no bearing on the present proceeding.

This clause, the Department of Justice here pointed out, makes it unlawful for any railroad company to transport in interstate commerce articles and commodities manufactured by it or under its authority, or in which the railroad may have an interest, direct or indirect.

The petition alleges that all the capital stock of the Elgin, Joliet & Eastern is owned by the United States Steel Corporation, and that the railroad is engaged in transporting in interstate commerce commodities manufactured and mined by certain subsidiaries of the Steel Corporation.

The filing of the suit came as no surprise here. It is known that the suit has been contemplated for several years. Both Mr. Collins and Mr. Smelker have been working on the case for three years or more. Mr. Collins formerly was an attorney for the Interstate Commerce Commission.

Republic Gets 10,000-Ton Order for Gas Line Pipe

YOUNGSTOWN, June 24.—The Republic Steel Corporation has received an additional order for 10,000 tons of pipe for the Missouri-Kansas Pipe Line Co. for a natural gas line from the Texas Panhandle to communities in Kansas, Missouri, Indiana, Illinois and Kentucky. Republic's share in the total award for this project is about 200 miles, or 20,000 tons, representing one-sixth of the total tonnage. The Youngstown Sheet & Tube Co. also shared liberally in the awards, which were made by the National Supply Co., Toledo. The project involves a total of 1250 miles of 10-in. pipe.

Tantalum Has Some Industrial Uses

Some valuable information on industrial applications of tantalum has been issued by J. Bishop & Co. Platinum Works, Malvern, Pa. A pamphlet "Tantalum Enters the Industrial Field," consists of 24 pages of illustrated descriptions of the various uses of this metal and products made therefrom, with tables giving technical characteristics, data on wire and corrosion resistance.

New Pottstown Company to Engage in Plate Work

The Pottstown-Sotter Tank Works, Inc., Pottstown, Pa., has been incorporated by interests which have purchased the former plant of the Sotter Brothers Co. in that city. The new company will construct the same type of steel plate work as was produced by the Sotter Brothers Co.

Officers of the new company are: President, P. E. Reynolds, vice-president, Croll-Reynolds Engineering Co., New York; vice-president, G. W. Wilmot, president of the Wilmot Engineering Co., Hazleton, Pa.; vice-president and general manager, R. L. Major, Jr., who was associated with the Sotter Brothers Co.; secretary, S. W. Croll, president, Croll-Reynolds Engineering Co., New York; treasurer, J. C. Hoffman, president of the Weatherly Foundry & Mfg. Co., Weatherly, Pa.; assistant treasurer, W. F. Otto.

Trade Practice Conference for Tack and Nail Makers

WASHINGTON, June 24.—Chairman Garland S. Ferguson, Jr., of the Federal Trade Commission, will preside at a trade practice conference of the tack and nail industry to be held at the Hotel New Yorker, New York, on Thursday of this week. Secret rebates, price discrimination, misbranding, false invoicing, arbitration and minimum standards of construction are included in the subjects to be taken up. The industry has an investment of approximately $7,500,000, according to the commission, and its annual volume of cut tacks, cut nails, wire tacks, staples, etc., is estimated at about $10,000,000.

Sheffield Stockholders Ratify Sale to "Armco"

Stockholders have approved the sale of the assets of the Sheffield Steel Corporation, Kansas City, Mo., to the American Rolling Mill Co. The plan was ratified by a vote of 183,712 shares represented at the meeting, or 91 per cent of the total authorized outstanding common stock.

Sheet & Tube Postpones Building New Mill

The Youngstown Sheet & Tube Co. has indefinitely postponed construction of a proposed $10,000,000 continuous mill at its Brier Hill works, Youngstown. It was planned to finance the project through current earnings, but depressed business, reducing net profits, prompted the delay.

Less Babbitt Used in 1930

Total apparent consumption of babbitt metal in May was 3,932,501 lb., compared with 3,868,408 lb. in April, according to reports received by the Department of Commerce from 31 firms. In May, 1929, the total was 5,478,697 lb. In the first five months the total apparent consumption was 20,687,515 lb., against 29,804,265 lb., in the corresponding period of last year.

Receives Russian Ore

The Mystic Iron Works, Everett, Mass., on June 20 received 7000 tons of Russian high-grade ore. It is the first lot of Russian ore purchased by the furnace, and the first received in this country since before the war. The Everett company plans further importations if the ore works out satisfactorily.

Non-Ferrous Metal Markets

Copper Back to 12 Cents—Large Sales of Tin—Lead and Zinc Lower

NEW YORK, June 24.

Copper.—Custom smelters on June 18 again lowered the quotation of electrolytic copper to 11.50c., delivered in the Connecticut Valley, a decline of ¼c. from the level on June 17. The reductions below 12c. were made by those smelters in order to dispose of their daily intake. It is estimated that about 5000 net tons was sold last week below 12c. by those producers. On June 19 the market snapped back to 12c., where it has remained since and at which level the primary producers have held their price since June 13. During the past few days the market has been very quiet, domestic consumers contracting only for their immediate needs.

Sales abroad have been fairly good at the quotation of 12.30c., c.i.f., usual European ports, which has prevailed since June 13. Sales for the week ended June 24 have been 12,000 to 13,000 gross tons, and for the month the total is estimated at about 53,000,000 lb. Prices for Lake copper have not been changed since June 13 and stand at 12c. to 12.12½c., delivered. Sales have been moderate.

Tin.—A large business has been done the past week, with both consumers and dealers the buyers. Sales for the week ended June 24 have been over 1200 tons, with the most active day on June 23, when about 500 tons changed hands. Most of the sales cover nearby and July-August deliveries. On each day there were wide fluctuations in prices, up and down, both here and abroad. There were large inquiries for distant deliveries, embracing the last quarter and the first quarter of 1931. For these positions it was difficult to get quotations because of a decided disinclination to sell far ahead.

Stocks in London warehouses for the week ended Saturday, June 21, were 21,617 tons, an increase of 771 tons for the week. Quotations for spot Straits have been slightly higher the past week, and today the quotation was 30.75c., New York. Quotations in London today were about £4 higher than a week ago, with spot standard quoted at £136 13s. 6d., future standard at £138 10s. and spot Straits at £138 15s. The Singapore price today was £138 2s. 6d.

Lead.—For the second time in the past week the American Smelting & Refining Co. has reduced its contract price. On June 23 it lowered its quotation from 5.40c. to 5.25c., New York. The corresponding price in the outside market is now 5.15c., St. Louis. The lowering of the quotation, without corresponding declines in the London market, is pointed to as rather unusual and was probably done to attract buying here, which has been confined to carload and small lots for early delivery to meet immediate requirements. Very little contracting for July is reported.

Zinc.—Values for both zinc ore and prime Western zinc have declined further during the week. Prime Western zinc at 4.32½c., East St. Louis, or 4.67½c., New York, are the lowest levels since Sept. 20, 1921, when the same quotation prevailed. This is the quotation of most producers, but it can possibly be shaded to 4.30c., East St. Louis, for desirable business. Under the conditions, demand is exceedingly light.

Ore at Joplin is down to $29 a ton, with the output undiminished at about 9500 tons for the week ended Saturday, June 21. The price compares with a range of $31 to $35 during May. Shipments fell off to 9874 tons last week, leaving the surplus at about 25,650 tons.

Antimony.—Prices for Chinese metal are a little easier in a dull market at 7c., duty paid, New York, for spot delivery, with futures at 6.87½c.

Nickel.—Ingot nickel in wholesale lots is quoted at 35c. a lb. with shot nickel at 36c. and electrolytic nickel in cathodes at 35c.

Aluminum.—Virgin metal, 98 to 99 per cent pure, is obtainable at the published price of 23.90c. a lb., delivered.

Non-Ferrous Metals at Chicago

CHICAGO, June 24.—Sales, as gaged by tonnage, are up as the result of a greater number of small orders. Prices for copper and tin are advanced while quotations for other

THE WEEK'S PRICES. CENTS PER POUND FOR EARLY DELIVERY

	June 24	June 23	June 21	June 20	June 19	June 18
Lake copper, New York	12.12½	12.12½	12.12½	12.12½	12.12½	12.12½
Electrolytic copper, N. Y.*	11.75	11.75	11.75	11.75	11.75	11.25
Straits tin, spot, N. Y.	30.75	29.75	....	30.37½	30.87½	29.87½
Zinc, East St. Louis	4.32½	4.32½	4.35	4.37½	4.37½	4.40
Zinc, New York	4.67½	4.67½	4.70	4.72½	4.72½	4.75
Lead, St. Louis	5.15	5.15	5.30	5.30	5.30	5.30
Lead, New York	5.25	5.25	5.40	5.40	5.40	5.40

*Refinery quotation; price ¼c. higher delivered in the Connecticut Valley.

New York, Chicago or Cleveland Warehouse

Delivered Prices, Base per Lb.

High brass	18.75c.
Copper, hot rolled, base sizes	21.75c.
Copper, cold rolled, 14 oz. and heavier, base sizes	24.00c.
Seamless Tubes—	
Brass	23.75c.
Copper	23.75c.
Brass Rods	17.00c.
Brazed Brass Tubes	26.25c.

New York Warehouse

Delivered Prices, Base per Lb.

Zinc sheets (No. 9), casks	10.25c. to 10.75c.
Zinc sheets, open	11.25c. to 11.75c.

Metals from New York Warehouse

Delivered Prices, Per Lb.

Tin, Straits pig	32.00c. to 33.00c.
Tin, bar	34.00c. to 35.00c.
Copper, Lake	13.75c.
Copper, electrolytic	13.50c.
Copper, casting	13.75c.
Zinc, slab	6.25c. to 7.25c.
Lead, American pig	6.50c. to 7.00c.
Lead, bar	8.00c. to 8.50c.
Antimony, Asiatic	10.00c. to 10.50c.
Aluminum No. 1 ingots for remelting (guaranteed over 99% pure)	25.00c. to 26.00c.
Alum. ingots, No. 12 alloys	24.00c. to 25.00c.
Babbitt metal, commercial grade	25.00c. to 35.00c.
Solder, ½ and ½	22.25c. to 23.25c.

Metals from Cleveland Warehouse

Delivered Prices, Per Lb.

Tin, Straits pig	35.00c.
Tin, bar	37.00c.
Copper, Lake	13.13c.
Copper, electrolytic	13.13c.
Copper, casting	12.75c.
Zinc, slab	7.00c. to 7.25c.
Lead, American pig	6.25c. to 6.50c.
Lead, bar	8.75c.
Antimony, Asiatic	14.00c.
Babbitt metal, medium grade	17.50c.
Babbitt metal, high grade	38.00c.
Solder, ½ and ½	22.25c.

Old Metals, Per Lb., New York

Buying prices represent what large dealers are paying for miscellaneous lots from smaller accumulators and selling prices are those charged consumers after the metal has been properly prepared for their uses.

	Dealers' Buying Prices	Dealers' Selling Prices
Copper, hvy. crucible	9.75c.	10.75c.
Copper, hvy. and wire	9.50c.	10.50c.
Copper, light and bottoms	8.50c.	9.50c.
Brass, heavy	6.00c.	6.75c.
Brass, light	4.50c.	5.75c.
Hvy. machine composition	8.00c.	8.75c.
No. 1 yel. brass turnings	5.50c.	6.50c.
No. 1 red brass or compos. turnings	7.50c.	8.50c.
Lead, heavy	4.00c.	4.62½c.
Lead, tea	3.00c.	3.50c.
Zinc	2.25c.	2.75c.
Sheet aluminum	7.50c.	9.50c.
Cast aluminum	7.00c.	9.00c.

non-ferrous commodities are lower. Movement of old metals is steady but in small gross volume.

Prices per lb., in carload lots: Lake copper, 12.25c.; tin, 30.50c.; lead, 5.40c.; zinc, 4.45c.; in less-than-carload lots, antimony, 8c. On old metals we quote copper wire, crucible shapes and copper clips, 9c.; copper bottoms, 8c.; red brass, 8c.; yellow brass, 6c.; lead pipe, 4c.; zinc, 1.75c.; pewter, No. 1, 17.50c.; tin-foil, 17.50c.; block tin, 22.50c.; aluminum, 7.50c.; all being dealers' prices for less-than-carload lots.

Fabricated Structural Steel

New Projects of 91,000 Tons Exceeded by One Week This Year—New Highway Requires 30,000 Tons

A TOTAL of more than 91,000 tons of new structural steel projects in the past week was exceeded this year only by the week of June 12, when new tonnage was more than 112,000 tons. More than half the past week's projects was made up of bridge work and grade elimination on a highway from Jersey City to Newark, N. J., about 30,000 tons, and two subway routes in New York, about 19,000 tons. A pier shed for the Munson Line in New York requires 5000 tons and an apartment hotel in Baltimore 4000 tons.

Awards of about 31,000 tons were smaller than in any of the previous three weeks. Among the larger awards were 6350 tons for two Erie Railroad piers on the Hudson River, 6000 tons in a new gymnasium and pool for Yale University at New Haven, Conn., and 1700 tons in an apartment building on Park Avenue, New York. Awards follow:

North Atlantic States

NEWTON, MASS., 800 tons, high school, to New England Structural Co.

BOSTON, 100 tons, East Boston Court House, to New England Structural Co.

NEW YORK, 1700 tons, apartment building for Empire Mortgage Co. at Sixty-eighth Street and Park Avenue, to Taylor-Fichter Steel Construction Co.

NEW YORK, 1200 tons, apartment building at 608 Fifth Avenue for Ogden-Goelet Estate, to Post & McCord.

MINEOLA, N. Y., 180 tons, high school, to Buckingham Steel Co.

NEW YORK CENTRAL RAILROAD, 250 tons, bridges at Richards, Ohio, to Bethlehem Steel Co.

PENNSYLVANIA RAILROAD, 350 tons, bridge on Washington Avenue, Philadelphia, to Belmont Iron Works.

BRONX, NEW YORK, 323 tons, oven steel work for Koppers Co., to McClintic-Marshall Co.

TROY, N. Y., 235 tons, oven steel work for Koppers Co., to McClintic-Marshall Co.

PENNSYLVANIA RAILROAD, 300 tons, transfer bridge in Philadelphia, to Bethlehem Steel Co.

READING RAILROAD, 1430 tons, pier at Port Richmond on Delaware River, to Belmont Iron Works.

READING RAILROAD, 110 tons, bridge at Ashland, Pa., to Bethlehem Steel Co.

PETERSBURG, VA., 125 tons, bridge over Appomattox River, to American Bridge Co.

BONCAR, W. VA., 1080 tons, buildings and bridge for Electro Metallurgical Corporation, to McClintic-Marshall Co.

ERIE RAILROAD, 3350 tons, pier 8 in Jersey City, Frederick Snare Corporation, general contractor, fabricated steel to Truscon Steel Co.

GREENBURGH, N. Y., 250 tons, school, to Guibert Steel Co.

MEADVILLE, PA., 150 tons, bank for Crawford County Trust Co., to Guibert Steel Co.

NEW HAVEN, CONN., 6000 tons, Yale University gymnasium and pool, to Levering & Garrigues Co.

PENNSYLVANIA RAILROAD, 157 tons, bridge at Fifty-second Street in West Philadelphia, to Phoenix Bridge Co.

ERIE RAILROAD, 3000 tons, pier at Weehawken, N. J., to unnamed fabricator.

The South

BIRMINGHAM, 150 tons, addition Goslin-Birmingham Mfg. Co. plant, to Ingalls Iron Works.

OCALA, FLA., 125 tons, Superior Earth Co., to Ingalls Iron Works.

SOUTHERN RAILWAY, 314 tons, three bridges, to Mount Vernon Bridge Co.

Central States

DETROIT, 918 tons, water tank and tower for city to McClintic-Marshall Co.

MILWAUKEE, 1000 tons, for penstocks for A. O. Smith Corporation, to Chicago Bridge & Iron Co.

APPLETON, WIS., 265 tons, Irving Zuehlke business block, to Lakeside Bridge & Steel Co.

RACINE, WIS., 120 tons, new Post Office building, to Lakeside Bridge & Steel Co.

SHEBOYGAN, WIS., 110 tons, addition for Garton Toy Mfg. Co., to Lakeside Bridge & Steel Co.

ST. PAUL, 6000 tons, First National Bank Building, to Bethlehem Steel Co; previously reported to an unnamed bidder.

CHICAGO, 2000 tons, furnace building for Wisconsin Steel Co., to McClintic-Marshall Co.

CHICAGO, 100 tons, substructure for bridge across Michigan Slip, to McClintic-Marshall Co.

Western States

TACOMA, WASH., 1200 tons, 42-in. welded steel pipe, to Birchfield Boiler Works.

SEATTLE, 100 tons, 24-in. welded steel pipe, to Birchfield Boiler Works.

SAN FRANCISCO, 300 tons, 20-in. welded steel pipe for city, to Western Pipe & Steel Co.

SAN FRANCISCO, 165 tons, apartment building, Clay Street, to McClintic-Marshall Co.

SAN FRANCISCO, 165 tons, apartment building, California and Joyce Streets, to McClintic-Marshall Co.

LOMPOC, CAL., 150 tons, gas holder for Santa Maria Gas Co., to Consolidated Steel Corporation.

RICHMOND, CAL., 200 tons, 3 and 6-in. welded steel pipe and four tanks, to Steel Tank & Pipe Co.

SAN JOSE, CAL., 140 tons, store for San Jose Hardware Co., to McClintic-Marshall Co.

OAKLAND, CAL., 100 tons, Sweet's Ballroom, to Pacific Coast Engineering Co.

BAY POINT, CAL., 500 tons, chemical plant for Shell Oil Co., to Judson-Pacific Co.

RIVERSIDE, CAL., 135 tons, hotel addition, to Modern Iron Works.

SACRAMENTO, 135 tons, State overhead crossing in Nevada County, to United States Steel Products Co.

SACRAMENTO, 615 tons, State bridge over Salinas River at Bradley, to United States Steel Products Co.

OLYMPIA, WASH., 300 tons, Queets River State bridge, to Wallace Bridge & Structural Steel Co.

KLAMATH FALLS, ORE., 100 tons, bank to Judson-Pacific Co.

STRUCTURAL PROJECTS PENDING

Inquiries for fabricated steel work include the following:

North Atlantic States

STATE OF MASSACHUSETTS, 300 tons, seven bridges.

CAMBRIDGE, MASS., 129 tons, Harvard College laboratory.

GREENFIELD, MASS., unstated tonnage, New England Telephone Co. building.

GLENS FALLS, N. Y., 365 tons, St. Mary's Church school.

NEW YORK, 14,800 tons, subway section 6, route 108 in Borough of Queens; bids open June 30.

NEW YORK, 4350 tons, subway section 7, route 106 on Mosholu Parkway; bids open June 27.

NEW YORK, 200 tons, approach to upper roadway of Queensborough bridge, for Department of Plant and Structures.

NEW YORK, 1050 tons, approach to Hudson River Bridge for Port of New York Authority.

STATE OF NEW YORK, 900 tons, highway bridges.

TARRYTOWN, N. Y., 450 tons, building for Chevrolet Motor Co.

PHILADELPHIA, 565 tons, dormitory for Drexel Institute.

UTICA, N. Y., 300 tons, Faxton Hospital.

NEW YORK, 5000 tons, pier shed for Munson Line.

BRYN MAWR, PA., 400 tons, apartment building.

SAFE HARBOR, PA., 600 tons, skimmer walls for Arundel Corporation.

BALTIMORE, 4000 tons, apartment hotel.

PINEY RIVER, VA., 800 tons, three buildings for Southern Mineral Products Co.

RICHMOND, VA., 600 tons, Federal Reserve Bank building.

JERSEY CITY, N. J., 30,000 tons, bridge work and grade elimination on highway from exit of Holland Tunnel to Newark.

PHILADELPHIA, 600 tons, two railroad bridges for City of Philadelphia and Pennsylvania Railroad.

The South

SOUTHERN RAILWAY, 700 tons, bridge.

LOUISVILLE & NASHVILLE RAILROAD, 1500 tons, bridge.

Central States

LOUISVILLE, 830 tons, Kentucky & Indiana Terminal Railroad track elevation work.

CHICAGO, 500 tons, mail building for

Chicago & Western Indiana Railroad.

CINCINNATI, 1000 tons, Cincinnati Union Terminal Co. building.

FLINT, MICH., 1000 tons, three buildings for St. Joseph's Hospital.

TRENTON, MICH., 1600 tons, Trenton Channel bridge for Wayne County Road Commission.

TOLEDO, 535 tons, physical education building for University of Toledo.

DELAWARE, OHIO, 170 tons, Ohio Wesleyan University building.

AKRON, OHIO, 165 tons, John R. Buchtel High School.

MERRILL, WIS., 210 tons, Center Avenue bridge; Stevens Brothers, St. Paul, low bidder on general contract.

WISCONSIN RAPIDS, WIS., 1600 tons, steel pipe line.

INDIANAPOLIS, 900 tons, Indianapolis Power & Light Co. building.

MILWAUKEE ROAD, 500 tons, bridges.

CLEVELAND HEIGHTS, 275 tons, high school addition.

CLEVELAND, 4200 tons, stadium.

COLUMBUS, OHIO, 500 tons, building for Buckeye Steel Casting Co.

Western States

OKLAHOMA CITY, 400 tons, Union Station.

SEATTLE, 6000 to 10,000 tons of plates for city pipe line.

SEATTLE, 114 tons, four towers for Duwamish Waterway crossing at West Michigan Street; bids opened.

SACRAMENTO, CAL., 168 tons, State bridge over Trinity River; bids July 9.

EMERYVILLE, CAL., 100 tons, hotel; Judson-Pacific Co., low bidder.

LONG BEACH, CAL., 400 tons, extension for Ford Motor Co. plant.

SPOKANE, WASH., 500 tons, Kresge store.

Reinforcing Steel

Power Dam Takes 2000 Tons—Inquiries 6600 Tons

AWARDS of 5550 tons of reinforcing steel the past week included 2000 tons for a power dam at Safe Harbor, Pa. Other tonnages were of moderate size. Contracts in June have amounted to 20,950 tons, compared with 43,150 tons in May. New jobs up for bids will take 6600 tons, the largest, 2000 tons, for a Post Office at Boston. Awards follow:

NEW YORK, 450 tons, Green Industries building, Washington and Albany Streets, to Concrete Steel Co.

BROOKLYN, 450 tons, Court House, to Igoe Brothers.

STATE OF NEW JERSEY, 190 tons, highway route 39, section 9, to Joseph T. Ryerson & Son, Inc.

MONMOUTH COUNTY, N. J., 170 tons, highway route 34, sections 13, 14B and 15, to Joseph T. Ryerson & Son, Inc.

SAFE HARBOR, PA., 2000 tons, power dam, to Kalman Steel Co.

CHICAGO, 100 tons, opera studio and warehouse, to Calumet Steel Co.

MILWAUKEE, tonnage not stated, institutional building, to Concrete Engineering Co.

ST. PAUL, 460 tons, First National Bank building, to Kalman Steel Co.

ST. PAUL, 450 tons, Northern States Power Co. building, to Kalman Steel Co.

SPRINGFIELD, ILL., 500 tons, State road work, to Calumet Steel Co.

SACRAMENTO, 350 tons, State bridge over Salinas River, near Bradley, to unnamed bidder.

SACRAMENTO, 128 tons, State highway work in Santa Clara County, to unnamed bidder.

PASADENA, CAL., 200 tons, Hall of Justice, to Blue Diamond Co.

OLYMPIA, WASH., 100 tons, State highway work, to Northwest Steel Rolling Mills.

Reinforcing Bars Pending

Inquiries for reinforcing steel bars include the following:

BOSTON, 2000 tons, Post Office.

CAMBRIDGE, MASS., 200 tons, Harvard College laboratory.

BROOKLYN, 310 tons, Post Office addition; general contract awarded to Magoba Construction Co., New York.

NEW YORK, 100 tons, subway tunnel under East River; Mason & Hanger Co., New York, general contractor.

CLEVELAND, 250 tons, Board of Education administration building.

CLEVELAND, 130 tons, building for W. S. Tyler Co.

CLEVELAND, 800 tons, General Electric Development Co. building.

GARY, IND., 250 tons, Wallace school.

HAMMOND, IND., 200 tons, school.

CHICAGO, 500 tons, apartment building at Seventieth Street and South Shore Drive; Costello & Fecher, general contractor.

CHICAGO, tonnage being estimated, addition to the Lawson Y. M. C. A. building.

CHICAGO, tonnage being estimated, north approach to Wabash Avenue bridge.

DECATUR, ILL., 600 tons, Staley Mfg. Co. building; plans being revised.

STATE LINE, ILL., 500 tons, second unit for State Line Generating Co.

SOUTH ST. PAUL, MINN., 100 tons, Post Office.

MILWAUKEE, 600 tons, elevator for Milwaukee Road; James Stuart, general contractor.

MILWAUKEE, 100 tons, theater; George A. Fuller Co., general contractor.

Cleveland Iron and Steel Market

(*Concluded from page* 1928)

Cleveland Board of Education will take about 250 tons. Prices are irregular.

Coke. — Ohio by-product foundry coke has been reestablished at $8.25 a ton, ovens, for July shipment. Orders continue light.

Old Material. — Mills are taking scrap in limited quantities, both in the Cleveland and Youngstown districts. The shutdown of a Cleveland steel plant the end of this week will leave in operation only one independent consumer of steel scrap. The market has a weak tone, but, as there is virtually no buying by dealers, prices are nominal. Dealers are buying small lots of steel for shipment to the Valley district at $14.50 to $14.75. Locally, borings and turnings are about 25c. a ton lower.

Prices per gross ton delivered consumers' yards:

Basic Open-Hearth Grades:	
No. 1 heavy melting steel	$12.00 to $12.50
No. 2 heavy melting steel	11.75 to 12.00
Compressed sheet steel	12.25 to 12.50
Light bundled sheet stampings	11.00 to 11.50
Drop forge flashings	10.50 to 11.00
Machine shop turnings	8.50 to 9.00
Short shoveling turnings	10.00 to 10.50
No. 1 railroad wrought	13.00 to 13.50
No. 2 railroad wrought	14.00 to 14.50
No. 1 busheling	11.75 to 12.00
Pipes and flues	9.00 to 9.50
Steel axle turnings	12.50 to 13.00
Acid Open-Hearth Grades:	
Low phos., forging crops	17.75 to 18.00
Low phos., billet bloom and slab crops	18.50 to 18.75
Low phos., sheet bar crops	18.00 to 18.50
Low phos., plate scrap	18.00 to 18.50
Blast Furnace Grades:	
Cast iron borings	9.00 to 9.50
Mixed borings and short turnings	9.00 to 9.50
No. 2 busheling	8.75 to 9.00
Cupola Grades:	
No. 1 cast	15.00 to 15.50
Railroad grate bars	11.00 to 12.00
Stove plate	12.00 to 12.50
Rails under 3 ft.	18.50 to 19.50
Miscellaneous:	
Rails for rolling	16.25 to 16.50
Railroad malleable	16.00 to 16.50

New York Iron and Steel Market

(*Concluded from page* 1926)

offering $11.50, delivered Lebanon, Pa. Machine shop turnings and stove plate are also off 50c., as a result of a recent purchase by Phoenixville and Harrisburg, Pa., consumers.

Dealers' buying prices per gross ton, f.o.b. New York:

No. 1 heavy melting steel	$9.00 to $10.50
Heavy melting steel (yard)	6.50 to 7.00
No. 1 hvy. breakable cast	8.00 to 8.50
Stove plate (steel works)	6.00 to 6.50
Locomotive grate bars	6.00 to 6.50
Machine shop turnings	5.50 to 6.00
Short shoveling turnings	5.00 to 5.50
Cast borings (blast fur. or steel works)	6.00
Mixed borings and turnings	5.00
Steel car axles	17.00
Iron car axles	19.50 to 20.00
Iron and steel pipe (1 in. dia., not under 2 ft. long)	7.75 to 8.25
Forge fire	8.00
No. 1 railroad wrought	10.00 to 10.50
No. 1 yard wrought, long	9.00 to 9.50
Rails for rolling	10.00
Stove plate (foundry)	8.00
Malleable cast (railroad)	10.50 to 11.00
Cast borings (chemical)	9.00 to 9.50

Prices per gross ton, deliv'd local foundries:

No. 1 machry. cast	$15.00
No. 1 hvy. cast (columns, bldg. materials, etc.); cupola size	13.00
No. 2 cast (radiators, cast boilers, etc.)	12.50

Railroad Equipment

Aluminum Co. of America is inquiring for 25 hopper cars.

Anglo-Chilean Consolidated Nitrate Corporation is in the market for 350 steel ore cars.

Erie is inquiring for two mail-baggage cars. This road has ordered three dining cars from Pullman Car & Mfg. Corporation and three all-steel combination mail-express cars from American Car & Foundry Co.

Boston & Maine has ordered four dining cars from Pullman Car & Mfg. Corporation.

Central of Georgia is inquiring for two baggage-express cars and one baggage-mail car.

Lightning rod manufacturers will hold a trade practice conference in Minneapolis on July 1. Commissioner Charles H. March of the Federal Trade Commission will preside.

British Call Unemployment Conference

Prompt Action Urged by Ramsay MacDonald to Anticipate Winter —British Sellers to India Seek Boycott of Defaulting Buyers

(*By Cable*)

LONDON, ENGLAND, June 23.

THE Government has called a conference to ascertain what further measures of cooperation are possible between the Government and local authorities to reduce unemployment. Premier MacDonald has urged rapid action to anticipate winter conditions, but no constructive suggestions have been made.

A representative deputation of manufacturers has waited on Minister Thomas of the Dominions, and President Graham of the Board of Trade, warning the Government of the inevitable consequences of State extravagances resulting in excessive taxation and pointing out that the position of British industry is critical and that it will be unable to carry the present burden of taxation, much less the increased demands threatened. Minister Thomas in reply spoke of an imperial conference and "frank discussions."

Boycott of Indian Merchants Sought

British merchants trading with India are endeavoring to secure Continental support to a boycott of native merchants defaulting on current contracts and are urging the Manchester Chamber of Commerce to press for the establishment in India of a special court for settlement of commercial disputes.

The Continental Steel Cartel has concluded arrangements for the classification of Swiss merchants, and similar negotiations are proceeding with Dutch steel distributers.

British Call Conference to Seek Reduction of Unemployment.

* * *

British Merchants Seek Continental Support in Boycott of Indian Buyers Defaulting on Contracts.

* * *

Japanese Can Maker to Build Tin Plate Mill With 50,000-Ton Annual Production.

* * *

Japan's Increasing Activity in Export of Rails and Pipe Causes Concern to European Mills.

French to Build Polish Railroad

A French group of industrialists and bankers, including the Schneider-Creusot interests and the Banque des Pays du Nord, is proposing to build a railroad connecting Gdynia with Upper Silesia, a line which is already partly built but has been interrupted by lack of State finances. If the offer is accepted the French group will repay the Polish Government the money already expended.

France considers the new United States tariff likely to inflict damage and foster resentment, with serious results, and this opinion is shared by most of the European nations.

German pig iron output in May was 860,000 metric tons with 86 furnaces in blast May 31, out of 175. This is the lowest output since 1926. The Krupp Rheinhausen works has blown out one furnace. The German raw steel output was 1,035,000 tons and the rolled steel production 735,000 tons.

Belgian output in May was 300,000 tons of pig iron and 285,000 tons of raw steel with 54 blast furnaces active at the end of April.

British Market Quiet

The iron and steel market depression is unrelieved and with holiday periods approaching little change is expected before the early fall. Three additional Cleveland hematite furnaces are blowing out, because of large unsalable stocks, and prices are nominal, but below cost of production. Makers anxious to liquidate would probably accept £3 10s. ($17.03) for large lots of East Coast, mixed numbers, as money is needed. Cleveland foundry iron is quiet but the association prices are unchanged.

Steel is quiet and makers have reaffirmed prices, which are likely to continue for several months, as the next meeting is not until October. The decision to leave steel prices unchanged was not unanimous, as certain districts, particularly on the

British and Continental European Export Prices per gross ton, f.o.b. United Kingdom Ports, Hamburg and Antwerp, with the £ at $4.8665 (par)

British Prices f.o.b. United Kingdom Ports

Ferromanganese, export	£10	15s.	to	£11	15s.	$52.30	to	$57.17
Billets, open-hearth	6	0	to	6	10	29.20	to	31.63
Black sheets, Japanese specifications	12	5				59.61		
Tin plate, per base box	0	18	to	0	18¼	4.37	to	4.43
						Cents a Lb.		
Steel bars, open-hearth	8	0	to	8	10	1.74	to	1.85
Beams, open-hearth	7	7½	to	7	17½	1.60	to	1.71
Channels, open-hearth	7	12½	to	8	12½	1.66	to	1.87
Angles, open-hearth	7	7½	to	7	17½	1.60	to	1.71
Black sheets, No. 24 gage	9	15	to	10	0	2.12	to	2.17
Galvanized sheets, No. 24 gage	11	17½				2.57		

Continental Prices, f.o.b. Antwerp or Hamburg

Foundry iron, 2.50 to 3.00 per cent sil., 1.00 per cent and more phos.	£3	2½s.	to	£3	3½s.	$15.21	to	$15.45
Billets, Thomas	4	13	to	4	14	22.63	to	22.87
Wire rods, low C., No. 5 B.W.G.	6	2	to	6	4	29.69	to	30.19
Rails, light	6	0				29.20		
Black sheets, No. 31 gage, Japanese	11	5	to	12	12	54.68	to	58.32
						Cents a Lb.		
Steel bars, merchant	5	7½				1.18		
Steel bars, deformed	5	6½	to	5	7½	1.17	to	1.18
Beams, Thomas, British standard	5	1	to	5	2½	1.11	to	1.14
Channels, Thomas, American sections	5	12	to	5	14	1.24	to	1.26
Angles, Thomas, 4-in. and larger, over ⅜-in. thick	5	6				1.17		
Angles, Thomas, 3-in.	5	7½				1.18		
Hoop and strip steel over 6-in. base	5	15				1.27		
Wire, plain, No. 8 gage	6	12½				1.43		
Wire, barbed, 4-pt. No. 12 B.W.G.	10	12½				2.30		
Wire nails, base	6	7½				$1.42 a keg		

North East Coast, were prepared to accept a lower market to secure more regular mill operations. Consumers are displeased, but it is suggested that they may now release orders that had been kept back.

The Continental market here is decidedly inactive, consumers holding large stocks, while maintenance of the Cartel prices restricts buyers' operations abroad.

Tin plate is quiet in sympathy with other markets, but mills are well engaged, and world consumption is being maintained. Prompt and forward tin plate has been sold at 18s. ($4.37) per base box, f.o.b. works port, by works with incomplete schedules to fill, but others are still asking 18s. 3d. ($4.43) per base box. Galvanized and black sheets are generally quiet.

Japan to Increase Tin Plate Capacity

YOKOHAMA, JAPAN, May 23.—Establishment of a tin plate mill with an ultimate capacity of 50,000 metric tons (1,102,000 base boxes) a year is planned by the Oriental Can Mfg. Co. in Osaka. The first unit will have an annual capacity of about 25,000 tons (551,000 base boxes), and will obtain its sheet bars from the Government Steel Works at Yawata and the Anzin works of the South Manchuria Railway Co.

Meanwhile, the Government works, the only producer of tin plate in Japan at present, is planning to increase its output by about 300 metric tons (6612 base boxes) a month. Demand is said to have improved considerably as a result of a higher quality product. Formerly the Government works produced about 45 per cent prime tin plate, 50 per cent seconds and 5 per cent wasters, but the present proportions are stated to be 65 per cent primes, 30 per cent seconds and 5 per cent wasters.

Europe Watches Japan's Growing Rail Output

HAMBURG, GERMANY, June 9.—Increasing competition from Japan on foreign rail contracts is causing uneasiness among the members of the International Rail Makers' Association. While no large orders have been taken by the Imperial Steel Works, Japan has appeared among the bidders for rail tonnages in South Africa and Egypt. Certain foreign rail buyers have placed trial orders in Japan, so that a large formal award would not be unexpected. The Japanese rails are all open-hearth steel.

YOKOHAMA, JAPAN, May 23.—A report that the Imperial Steel Works has applied for membership in the International Rail Makers' Association on terms that foreign makers withdraw from competition in Japan, and that the Chinese and Manchurian markets be equally distributed, is denied by the company. The Government-owned steel mill produced 270,000 tons of rails in 1929, an increase of 100,000 tons from the previous year's output, and is seeking to develop export business in China and other Far Eastern countries.

Annual Refunds to Large British Steel Buyers

HAMBURG, GERMANY, June 9.—Belgian and German producers of semi-finished steel have agreed with British importers on new terms, by which the large consumer of foreign semi-finished material will receive an annual refund based on the total tonnage purchased during the year.

Turkey to Buy Farm Machinery

BERLIN, GERMANY, June 10.—A $4,000,000 credit has been established by the Turkish Government through the Banque Agricole in Angora and Istamboul, to use for the purchase of modern agricultural machinery. The equipment will be distributed to farmers in Turkey and will be bought on lists to be issued at intervals by the Banque Agricole.

Germany Imports Cans for Detinning

HAMBURG, GERMANY, June 9.—Despite low prices for tin, there is a growing use of detinning in Germany. One of the leading detinning companies is the T. Goldschmidt A. G. of Essen, which operates two plants. Recently old cans have been imported from Australia and South Africa, and a small shipment of cans for detinning has arrived from the United States.

Japan Largest Buyer of German Rolling Mills

HAMBURG, GERMANY, June 9.—In the past year Japan has become Germany's best customer for rolling mill equipment. During 1929 the Japanese bought upward of $18,000,000 worth of rolling mill and other steel plant equipment from Germany, and on the basis of orders so far this year it is estimated that 1930 will exceed the total of last year by $5,000,000 or more. Sheet and wire rod mills represent a large part of the actual and prospective business.

Japan May Join Tube Cartel

YOKOHAMA, JAPAN, May 23.—Application for membership in the International Tube Cartel is understood to have been made by the Japan Steel Tube Co., and the Sumitomo Tube Co. is expected to apply if its competitor becomes a member. Japan's production of steel tubes is about 70,000 tons annually, and imports total about 20,000 tons.

Further Drop in Wholesale Prices

Wholesale prices of commodities in May are reported by the United States Bureau of Labor Statistics at 89.1, compared with 90.7 in April and 95.8 in May, 1929. All figures refer to 100 as the average for 1926. The decline has been proceeding for ten months.

Except for fuel, which showed a fractional rise, and house furnishing goods, which showed no change, all of the remaining subdivisions indicate drops compared with April. Many of these drops were sharp. Metals and metal products went down from 98.8 to 96.8, owing to a moderate decline in iron and steel—from 93.8 to 92.9, and a drastic cut in non-ferrous metals—from 90.5 to 80.6. The other components of this group, agricultural implements, automobiles and other metal products, remained the same in May as in April. Structural steel, included under buildng materials, showed no change.

Subdividing the commodities into three groups, raw materials declined from 89.8 to 87.8 and semi-manufactured articles from 87.9 to 83.6, while finished products showed a much smaller reduction, from 91.9 to 91.

Sheet Sales, Production and Shipments Decline

Sales of steel sheets during May declined sharply and both production and shipments fell off materially as compared with April, as is shown by the monthly report of the National Association of Flat Rolled Steel Manufacturers, covering independent mills. Sales were 204,589 tons, compared with 300,086 tons in April, or a decline of 95,497 tons. Production was 274,220 tons, compared with 308,988 tons in April. The decline in shipments was somewhat less than the falling off in production. Unfilled orders on June 1 dropped more than 65,000 tons. The May report and comparisons in net tons follow:

	May	April	March
Capacity per month...	553,800	544,400	521,250
Percentage reporting..	67.6	67.6	67.5
Sales	204,589	300,086	299,764
Production	274,220	308,988	259,658
Shipments	266,436	291,601	275,235
Unfilled orders.....	461,756	526,827	524,230
Unshipped orders.....	119,117	126,703	116,470
Unsold stocks.....	85,585	81,671	75,847
Percentages, Based on Capacity			
Sales	54.7	81.5	85.1
Production	73.3	84.0	73.7
Shipments	71.2	79.2	78.1
Unfilled orders	123.4	143.2	148.8
Unshipped orders.....	31.8	34.4	33.1
Unsold stocks.....	22.9	22.2	21.5

Large Rivet Order for Ships

A contract for 1700 tons of rivets required in two 30,000-ton ships for the United States Lines was closed June 19 with the New York office of the Pittsburgh Screw & Bolt Co. by the New York Shipbuilding Corporation, Camden, N. J.

Unemployment Plan for General Electric

Company and Employees to Establish Fund to Protect Workers in Periods of Recession

AN unemployment plan for General Electric Co. workers, designed to make funds available for employees during times of need or unemployment, has been announced by President Gerard Swope. The money will be raised through equal contributions by the employees and the company. Many provisions in the plan are an outgrowth of suggestions from committees of leading workmen.

At the same time Mr. Swope announced a plan for the stabilization of employment by reducing to a minimum the cause and effect of unemployment. Rules are set down for all factories as to what to do and what not to do when business is either on the increase or work is falling off.

The unemployment plan may be adopted by any works, regardless of the action of the other plants, and the company will participate upon an affirmative vote of 60 per cent or more of the eligible employees of that works. Any employee with continuous service with the company of one year or more is eligible for membership. By enrolling, the participant agrees to pay into a trust fund created by the plan approximately 1 per cent of his actual weekly or monthly earnings for a period of three years, but only so long as his earnings are 50 per cent or more of his average full time weekly or monthly earnings.

How the Plan is to Work

In case of abnormal times of unemployment, normal contributions by participating employees would cease and all employees would be called upon to contribute. In other words, employees who are subject to lay-offs would aid themselves as much as possible, and, when they could no longer do this, then those employees who are still working would contribute toward the aid of the men who are laid off, while the General Electric Co. would itself contribute in both instances to an equal extent to that of the participating employees.

According to the plan, up to 3 per cent of the contributions paid into the trust will be available for the relief of employees or former employees in need; up to 27 per cent of the normal contributions will be available for loans to employees who are members, and the balance, approximately 70 per cent of the normal, together with all emergency contributions and all interest on the funds, will be available for unemployment payments.

The trust which will handle the funds will be in charge of a board of trustees, and the General Electric Co. will guarantee 5 per cent interest. The company will also pay the administration expenses for the first two years.

The plan will operate separately in each works, and its administration in each works will be vested in a board of not less than four or more than 16 members, one half of whom will be elected by the participating members and the other half appointed by the General Electric Co. No payments will be made from the fund for at least six months after its creation and thereafter only to employees who have made normal payments for at least six months. Payments to contributing employees, who receive notice of a temporary lay-off, shall be 50 per cent of their average earnings for full time, but in no case more than $20 a week, and such payments shall not exceed 10 weeks in any 12 consecutive months. When an employee is working part time and receiving less than 50 per cent of his average full time wage, he may be eligible for payments amounting to the difference between the amount he is receiving as wages and the maximum he might be entitled to under the unemployment plan.

All to Contribute in Emergency

Should an unemployment emergency arise at any particular works, when payments from the fund are 100 per cent or more of the average normal receipts, then all employees of this works, whether participants in the plan or not, and including the highest officers of the company connected with the particular works, will be called upon to contribute approximately 1 per cent of weekly or monthly earnings. Also, in such an emergency, all the general and district commercial men, general manufacturing, engineering and administrative employees of the company at all works and offices in the United States not on a particular works payroll, shall contribute their proportion to the fund. This proportion shall be determined by the ratio of the average earnings of the contributing employees of the particular works to the total payroll of the eligible employees of all works of the company.

For example, if the Schenectady works should adopt the plan, and the average earnings of its contributing employees should be 20 per cent of the total payroll of the eligible employees of all works, then 20 per cent of 1 per cent shall be contributed to the fund. Thus, an office employee receiving $2,000 a year would be called upon to contribute $4 a year. The General Electric Co. will contribute dollar for dollar to all such monies added to the fund. After the emergency is over, normal payments to the fund by participants will be renewed.

Under the plan for stabilizing employment, regulations set down by Mr. Swope follow:

When Business Is Increasing:

1. Increase the working force by adding employees as slowly as possible.
2. Increase the number in especially busy departments by transfers from other departments.
3. Resort to overtime in particular departments and generally before increasing the working force.
4. Postpone plant renewal and maintenance work as much as possible, employing the men on regular production.

When Work Begins to Fall Off:

1. Cease hiring at once.
2. Cut out all possible overtime and bring departments down to the normal week.
3. Transfer people from slack to busier departments.
4. Stimulate the sales department to secure cooperation from customers and get business for future delivery.
5. Build standard apparatus for stock up to * months shipments, based on average of last three years sales, adjusted to expectation of next two years.
6. See that stocks at all factory and district warehouses are brought up to this maximum.
7. Use men on maintenance and repair work, bringing the plant and equipment up to a high standard.
8. Cut the normal week as generally and gradually as possible, by departments (down to 50 per cent of the normal week).
9. Proceed with construction of increased plant facilities previously planned, using our own men as far as possible.
10. Drop new employees with less than one year of service—single people with no dependents and who are most easily spared first—always with not less than one week's notice.
11. In accordance with our custom established for some time, employees should be told whether it is a temporary lay-off due to lack of work or permanent lay-off, and in every instance of permanent lay-off the usual compensation, if any, should be paid, depending upon character of work, age and length of service.

*Varies.

Philadelphia Steel Men Visit Wire Plant

A large number of members of the Philadelphia chapter of the American Society for Steel Treating, by special arrangement with the John A. Roebling's Sons Co., visited the Roebling plant at Roebling, N. J., on Wednesday, June 11. The manufacture of wire from the melting furnace to the finished product was shown, and at the close of the inspection trip the annual business meeting of the chapter was held in the assembly hall of the plant, followed by a dinner at the Mansion House, Fieldsboro, N. J. The principal speaker was Daniel Ross, who gave a history of the business established by John R. Roebling from its earliest inception.

The Keystone of Industrial Arch

(*Concluded from page* 1878)

Because of this, the foreman is personally responsible for keeping the men in his shop satisfied to the extent that the work in hand is carried to a speedy and satisfactory conclusion. This responsibility he cannot delegate or shift; it is his and he alone must assume it. To evade or transfer it for personal or temperamental reasons will prove disastrous, for the workmen must know that their foreman is something more in the industrial organization than a mere boss of men.

His Function as Personnel Head

The foreman must train himself in the school of new industrial thought. If he is to increase production and decrease costs he must be the proper type of leader for his men. They are the producers, and it lies within their power to regulate a large part of the cost of production. A corollary of this is that he must possess the qualifications requisite for leadership: forethought, tact, patience, impartiality, etc.

Too much stress cannot be placed on the fact that, since the workers are the producers, in their hands lies much of the cost of production, as do errors in workmanship. When production is lagging the employees can often furnish the cause, when the foreman is unable to explain. When the finished product is being rejected in large numbers the employees often know the reason, though the inspector is mystified. When there is lack of cooperation and coordination in management the employees often hold the key to the situation, which the manager does not understand.

If the foreman is to expect efficiency and cooperation from his men, he must be efficient and cooperative himself. He must be absolutely square and on the level with each of his workmen, and at the same time let each one know what is expected of him. He must be considerate and diplomatic, for a "bawling out" at the wrong time will work irreparable damage. He must handle difficult personnel cases and questions "with a hand of steel in a glove of velvet," as has been well said.

Responsibility for Labor Turnover

If a man is dissatisfied and quits, the foreman should always acquaint himself with the real cause. If the fault be his, the onus of correcting falls on him. The foreman alone is sometimes responsible for the turnover of factory labor. He cannot at any time afford to undo any good done by a workman. Such an act on his part destroys in others the incentive to efficiency. His shop motto should be: "a satisfied and contented working force all the time."

The foreman is also an instructor of shop personnel. He not only trains his men in the work of their particular jobs, but teaches them the duties of other jobs, thereby maintaining a versatile and trained working force at all times. He analyzes the various jobs as well as the workers assigned thereto, which is a most important function of shop management.

There are fast producers and slow producers, accurate producers and careless producers. There are those who can produce in large quantities without impairing the quality of the product. Thousands of dollars are spent to purchase and install machinery to increase efficiency, and then inefficient operators are often assigned to those machines. Men should be analyzed to determine what they can do without undue strain or fatigue. When contracts for delivery, where time is of the essence, are entered into, the foreman is in a better position to estimate the requirement of time to complete the work, if he knows the capabilities of his men.

Stabilizing the Working Force

The foreman can play a very important part in stabilizing employment, by planning his working force with the same carefulness as he plans his production or the purchase of material. The employment and maintenance of labor, as well as the amount to be spent for this purpose, deserve more planning than production or the purchase of material, because the employer's payroll is his greatest item of expense.

Many are eager to enlarge the working force at the slightest additional increase in business. It should not be forgotten that hiring men has its determinate and indeterminate expenses. A workman should not be added to the payroll until as much thought is given to the necessity for it as is given to the necessity for the installation of an additional piece of equipment or to the purchase of additional material. The cost of a new employee is often greater than either of these.

To stabilize employment the foreman must plan his employment with the same zeal as he plans production. It is the fear of unemployment that naturally inclines the operator to make his work last as long as possible. The contented employee has a positive money value, and one of the ways to keep him so is to "remove the nightmare of unemployment from his pillow."

The foreman can accomplish much by encouraging his workmen to offer constructive suggestions. The fact cannot be lost sight of that all workers are not mere automatons. Some possess undreamed of ability and some have a reservoir of knowledge yet untapped. Some foremen do not like to seek advice and others object to having it proffered, especially by workers. It should be remembered that the machine operator by day may be a deep student of shop management at night.

Potentiality can be found in shops, both large and small, if an opportunity is afforded to display latent ability. C. E. Knoeppel has said: "I know of no greater responsibility of man than that of the one—whether worker, supervisor, executive, owner, banker or lawyer—who, in industry, either by accident, which is inexcusable, or by design, which is unpardonable, fails to do all in his power to help workers give birth to their mental children."

His Function in Promoting Safety

The foreman is the greatest of all potential safety engineers, in so far as he is in a position to reduce industrial accidents. He is the one person capable of observing unsafe practices and of correcting them as they occur. He knows where and when a hazardous condition exists and he can remedy it quicker than anyone else. All of which indicates that the foreman is a big factor in safety work.

If a plant inaugurates a safety program it cannot afford to disregard the foreman for he will be either an ally or an enemy. If he proves to be the latter, very little can be accomplished in preventing accidents.

Perhaps the greatest single industrial waste is due to preventable accidents. Their incidental expense is far greater than is commonly believed. It exceeds many times the total cost of insurance claims and medical treatment, for the reason that there are so many expenses connected with an injury to an employee that cannot be covered by insurance, and must therefore be borne by the employer.

In accident prevention the foreman is both instructor and supervisor. Not all workmen know how to work in a safe manner. Some of the more experienced do, but they will indulge in unsafe practices either through habit, eagerness or momentary carelessness. The foreman should carefully instruct the inexperienced and strictly supervise the careless.

It is the foreman's job to see that the proper safeguards are installed to help prevent accidents. There are always hazardous places and conditions which cannot be safeguarded. In such cases he should instruct his men as to the proper manner when working around such places, and caution them not to sacrifice safety for speed.

The foreman should investigate all accidents which occur in his shop, in an effort to ascertain the cause, for accidents do not happen — they are caused. It is the preventable accidents that should be avoided; they are the most costly for the reason that they occur oftenest. It is always important and advisable to have safety campaigns, safety slogans and safety posters, but better than any or all of these is a safe foreman. It has been said that research proves that 98 per cent of our accidents are preventable, and that 88 per cent of them are due, not to unguarded machinery, but to supervisory conditions within the control of the foreman.

Coordinating All Elements of the Industrial Machine

The foreman's final important function lies in coordination and cooperation. He must not only coordinate

the work of his shop with that of others, but he must cooperate with the various departments of the industry. For example, he must cooperate with the planning and estimating section, to see that the proper estimates of cost and time are placed on the jobs he is to perform. He must cooperate with the purchasing and employment departments by informing these departments as far in advance as possible of his requirements for material and labor, so there will be no unnecessary and avoidable delay in prosecuting his work. He must cooperate with the cost department in furnishing the necessary information as to the cost, both direct and indirect, of work performed. Above all he must cooperate with the executive department at all times, in a mutual effort to improve the organization as a whole and to effect a better system of coordinated management.

The foreman, figuratively speaking, is the keystone of the industrial arch—the last-set stone which completes the arch and locks its members together. B. C. Forbes in a recent newspaper article said: "American foremen, collectively, have more to do with molding sentiment among the rank and file of the people and families of this country than politicians or editorial writers or preachers or teachers or labor union leaders, or any other class."

Need of Standardized Cost Figures

(*Concluded from page* 1883)

to its activities the finding of new uses for castings. He thought that a solution of the problem for the individual foundryman was to develop a line of specialties.

This subject was also discussed at informal group meetings that followed the regular session. Mr. Denison presided at the meeting of the gray iron group and Mr. Hopkins was chairman of a non-ferrous group meeting.

More Attention to Alloy Iron Recommended

Mr. Denison, in leading the discussion during the gray iron group meeting, said that his foundry had made inroads on forgings by the manufacture of high-test iron castings, and the opinion was freely expressed that the gray iron foundry business would be stabilized and some business that had been lost would be recovered by paying more attention to alloy castings.

How to Comply With Ohio Foundry Code

THE proposed Ohio foundry code, which is a revision of the present State code, was discussed by J. W. Beall, Ohio Steel Foundry Co., Lima. The only new feature of this code, he said, is that it requires first aid equipment for all foundries. Ohio foundries generally have their mechanical equipment properly protected, so that it would be no hardship for them to live up to the specific requirements of the code in this respect. However, he pointed out that accidents largely are due to the human equation. In the three plants of his company there had been only one case of injury in 12 years due to mechanical equipment, others having been caused by carelessness.

The speaker called attention to provisions of the Ohio law and code that imposed a penalty of 15 to 50 per cent, in addition to the regular award, in case an injury results from failure of the foundry to comply with the provisions of the code. This penalty does not come out of the State insurance fund but is assessed against the foundryman. Consequently, he said, it pays to live up to the specific requirements of the code so that the foundryman will not have to pay an additional award that comes directly out of his pocket.

Stressing the importance of seeing that employees comply with safety rules, the speaker declared that the foreman in every foundry is the key man to safety and that his cooperation is needed to see that employees comply with safety regulations. Safety educational work should be carried on continually, but the desired results are not obtained unless the foreman takes an interest in the matter and sees that his men obey the rules.

Refractory Problems Harder to Solve

REFRACTORIES, as pertaining to the foundry industry, were discussed by D. A. Williston, LaClede-Christy Co., St. Louis. He outlined the origin and locations of various fire clays, refractory failures and what to expect and what not to expect from refractories, pointing out that today foundries are melting at higher temperatures and longer heats than formerly, thus increasing both the refractory requirements and the importance of solving refractory problems.

Future Meetings

At a meeting of the board of directors it was decided to hold four sectional conferences a year in four different sections of the State and three additional meetings in each district of the foundrymen in that section. Under this plan there will be four meetings a year in each of the four sections of the State.

Molybdenum in 1929

An attractive booklet, entitled "Molybdenum in 1929," has recently been issued by the Climax Molybdenum Co., 295 Madison Avenue, New York. Its 84 pages are well illustrated and contain extracts from technical journals, which appeared in 1929 in the United States and European countries, dealing with the results of the application of molybdenum in alloy steels, in nitriding, in gray iron castings, in alloy steel castings, in aircraft, in special alloy steels and in acid-resistant alloy steels.

Fabricated Steel Bookings Largest of Year

WASHINGTON, June 20.—Gaining 21.2 per cent, or 41,449 tons, orders for fabricated structural steel in May, reported to the Department of Commerce by the principal producers, totaled 236,323 tons, against 194,874 tons in April. Operations were at the rate of 75 per cent and 59 per cent of capacity, respectively. May bookings were the largest since February, which were reported as 236,897 tons.

Computed total bookings in May were 300,000 tons, compared with 236,000 tons in April. May shipments were computed at 280,000 tons, or 70 per cent of capacity, against 304,000 tons, or 76 per cent of capacity, in April. May bookings were the largest for any month of 1930 to date.

Orders reported for the first five months aggregated, in 1930, 1,087,620 tons, or 66 per cent of capacity, against 1,308,524 tons, or 89 per cent of capacity, last year.

Computed bookings were 1,320,000 tons and 1,574,650 tons, respectively. Computed shipments were 1,396,000 tons, or 70 per cent of capacity, compared with 1,412,950 tons, or 73 per cent of capacity.

Westinghouse and English Company to Cooperate

The Westinghouse Electric & Mfg. Co., through its subsidiary, the Westinghouse Electric International Co., has entered into a comprehensive arrangement with the English Electric Co., Ltd., of Queens House, Kingsway, London, whereby there will be an exchange of technical information between the two organizations on steam turbines and electrical apparatus.

The arrangement grants licenses for the use of patents and for the manufacture and sale of various products. These licenses will, of course, be subject to the existing commitments of the two companies in various parts of the world. Under this arrangement each company will have the benefit of the results of the research work carried on by each company in the field covered by the agreement.

The technical and manufacturing tie-up does not entail any change of control of the English company, although it is probable that the American company will later acquire a small financial interest in the British company.

"A Study of Slip Lines, Strain Lines and Cracks in Metals Under Repeated Stress," by Prof. H. F. Moore and Tibor Ver, is the title of Bulletin No. 208 of the Engineering Experiment Station of the University of Illinois, Urbana, Ill. It contains 62 pages and is illustrated with nearly 50 photomicrographs.

Automobile Production Down from 1929

WASHINGTON, June 21.—Making a decline of 25,681 units, 417,154 motor vehicles were produced in the United States in May, against 442,835 in April, according to the Department of Commerce. Passenger car production declined by 12,440 units to 362,270 from 374,710, while the truck output fell 13,190 units to 54,370 from 67,560. The taxicab output was 514 against 565.

For the first five months, production in the United States in 1930 totaled 1,883,616 motor vehicles, a drop of 795,895 from 2,679,511 of last year. The passenger car output declined 706,620 units to 1,605,306 from 2,311,926, while the truck output decreased 84,082 units, to 274,248 from 358,330. The taxicab output dropped to 4062 from 9255. Total output fell 29.7 per cent; passenger cars, 30.6 per cent; trucks, 23.5 per cent.

Canadian Production Increased

May production in Canada showed a slight increase, rising to 24,672 motor vehicles from 24,257 in April. The May output consisted of 21,251 passenger cars against 20,872 in April, and 3421 trucks compared with 3385.

For the first five months, Canadian production totaled 95,595 units in 1930, against 166,869 last year. Passenger car production totaled 81,165 compared with 135,102, and truck output totaled 14,430 against 31,767.

Gulf States Steel Ready to Start New Plate Mill

Machinery is being adjusted at the new plate mill of the Gulf States Steel Co. at Alabama City preparatory to operations that are to be begun within the next few days. This is a universal mill, housed in a new all-steel and sheet metal building, 1000 ft. long and 80 ft. wide. It will roll universal plates up to 48 in. wide and down to ⅛ in. thick. Sheared plates can be rolled up to 72 in. wide with a minimum thickness of about 3-16 in. It is served by two end-charged, side-discharging furnaces, each accommodating 58 ft. of slabs. The main motor is 4000 hp., d.c., driven by a motor-generator set with flywheel. This is said to be the first application of a direct-connected blooming mill type d.c. motor to a three-high plate mill.

The mill machinery was built largely by the Mackintosh-Hemphill Co., Pittsburgh, and the James Criswell Co. Electrical equipment was furnished by the Westinghouse Electric & Mfg. Co. F. H. McGraw & Co., of New York, were the structural engineers.

The new plate mill is a part of a $6,000,000 development program authorized by the Gulf States Steel Co. last year. A new blooming mill was placed in operation several weeks ago, and steel framework is now being completed on the buildings for the new sheet plant, which is to have six mills.

Two new rows of 64-in. by 14-ft. soaking pits have been built, providing additional capacity for 80 ingots. The six open-hearths of the company have been rebuilt and their capacity increased from 75 to 90 tons each.

New Monel Metal Finish Is Developed

A new monel metal finish, designated as No. 8, has been developed by the Huntington mill of the International Nickel Co. to replace those finishes formerly known as Nos. 3 and 4.

It has a silver satin appearance with more luster than either of the others, but without the high reflectivity of the full-finished No. 5. It was developed to eliminate the need on the part of fabricators for further polishing of their products after manufacturing operations are completed. It is especially adapted to kitchen sinks.

Favor National Museum of Engineering

A plan for the Government's providing in Washington a home for the National Museum of Engineering and Industry received a favorable recognition in a hearing held in Washington on Senate Bill No. 454 devoted to the subject. Addresses were made by President Thomas Ewing of the Museum organization, J. F. Keller, president, Keller Mechanical Engineering Co., Brooklyn, N. Y., C. W. Mitman, curator of the Industrial Engineering Collection of the National Museum, now under the custodianship of the Smithsonian Institution, M. H. Bletz of the Bureau of Foreign and Domestic Commerce, Department of Commerce, Capt. E. N. Chisholm, engineer of the National Park and Planning Commission of the District of Columbia, L. V. Coleman, director, American Association of Museums, Washington, Blake R. Van Leer, assistant secretary, American Engineering Council, Washington, and H. S. Bryant, Smithsonian Institution, Washington.

Non-Ferrous Ingot Deliveries in May

CHICAGO, June 19.—The combined deliveries of brass and bronze ingots and billets by the members of the Non-Ferrous Ingot Metal Institute for May amounted to 6885 tons. This compares with 6041 tons in April, with 6632 tons in March, with 6898 tons in February and with 6154 tons in January.

Direct Dealing in Scrap Condemned in Brief

At the request of James A. Farrell, president, United States Steel Corporation, who is chairman of the special committee of the American Iron and Steel Institute, a brief outlining the position of the Institute of Scrap Iron and Steel on direct dealing between consumers and producers of scrap, has been submitted by Benjamin Schwartz, director general of the scrap institute, to Mr. Farrell, Eugene G. Grace and L. E. Block, members of the committee. After discussing the problem of direct dealing, the brief requests the committee to condemn the practices involved as uneconomic and as against the best interests of the steel industry and of the national welfare.

It also requests the American Iron and Steel Institute authorize a scrap marketing survey, with the cooperation of the Institute of Scrap Iron and Steel, with the aim of improving the machinery for the marketing, distribution and full utilization of scrap.

The brief is an outgrowth of a meeting between Mr. Farrell's committee and the committee of the Institute of Scrap Iron and Steel, consisting of Benjamin Schwartz, director general; Samuel N. Summer, president, and Phil W. Frieder, chairman of the executive committee, which was held on May 9. At that time, Mr. Farrell, Mr. Grace and Mr. Block consented to constitute themselves as a standing committee to confer with the Institute of Scrap Iron and Steel on scrap problems of mutual interest.

Steel and Malleable Castings Made and Sold

	May, 1930	April, 1930	May, 1929
Commercial steel castings (a), net tons:			
Production, total	103,405(b)	111,366	127,189(c)
do. per cent of capacity	72	77	87
do. railroad items	42,317(b)	45,409	58,636(c)
do. miscellaneous	60,988	65,457	68,553
do. five months	545,701(d)	.....	553,274
New orders, total	89,687(b)	92,966	113,329
do. per cent of capacity	62	64	78
do. railroad items	41,252	35,213	44,919
do. miscellaneous	48,435(e)	57,753	68,410
do. five months	521,766	.....	628,733(c)
Malleable iron castings (a), net tons:			
Production	53,729(b)	62,035	81,641
do. five months	306,551	.....	395,750
Shipments	56,474(b)	60,884	80,527
do. five months	300,313	.....	390,882
Orders	47,527(b)	54,685	76,949
do. five months	282,742	.....	399,233

(a) United States Department of Commerce.
(b) Smallest since last December.
(c) Largest ever reached.
(d) Largest ever reached, except in 1929.
(e) Smallest since September, 1928.

Machinery Markets and News of the Works

Market Dullness Unrelieved

Machine Tool Demands at Low Ebb—Some Plants Will Shut Down for Vacation Periods

DEMAND for machine tools has dropped to such a low point that many in the trade believe that the end of the recession is here or at least near. However, with the two traditionally dull months of summer just ahead, not much, if any, improvement is expected before September. Production schedules of machine tool companies are being curtailed, and it is indicated that quite a number of plants will be shut down for vacation periods of two weeks or more.

Orders to defer shipment of machine tools, recently contracted for, add to the problems of machine tool manufacturers in keeping up production schedules. The Milwaukee Road is one buyer which has requested later shipment on tools recently purchased.

Not only are purchases of shop equipment few, but requests for prices have fallen off. Outstanding exceptions are an inquiry for 25 to 30 turret lathes from the Amtorg Trading Corporation, New York, official buying representative of the Soviet government, and one from the Nichols Copper Co., New York, for about 15 machines. The Board of Transportation of the city of New York has inquired for cranes for a subway repair shop, and it is expected also to buy machine tools, a list of which was submitted for bids a year or so ago.

New York

NEW YORK, June 24.—Some local machine tool dealers report a moderate gain in orders the past week, but it is not unlikely that this improvement was a natural and perhaps temporary reaction from the extreme dullness of the preceding few weeks. It cannot be said that there are any signs of a sustained gain in sales in the near future, although the opinion prevails that the low point of demand is now at hand or very near. With vacations and other influences which exert themselves during the summer months, an uptrend in sales is not expected before September.

Nichols Copper Co. has received prices on a list of about 15 tools. The Board of Transportation, city of New York, is inquiring for cranes for its subway repair shops on 207th Street, Manhattan, and is expected to buy a list of machine tools, on which the first bids were taken a year or more ago.

Haiss Mfg. Co., 391 Canal Place, New York, manufacturer of wagon loaders, material handling machinery, parts, etc., has awarded general contract to Philip Roth & Son, 1738 Mahan Avenue, for one-story plant unit, to cost about $30,000 with equipment. Leo Stillman, 2419 Stillman Avenue, is architect.

Gilbert J. Schofield Co., Albany, N. Y., manufacturer of paper mill machinery and other mechanical equipment, has taken over part of former textile mill of Roy Woolen Co., Watervliet, N. Y., for new plant, where expansion will be carried out, and other space is available for further extensions. Albany Boat Corporation also recently leased another section of former woolen mill property.

Knickerbocker Toy Co., Inc., 85 Fifth Avenue, New York, has leased a floor in building at 15-17 East Sixteenth Street, for expansion.

Erie Railroad Co., 50 Church Street, New York, has awarded general contract to Frederick Snare Corporation, 114 Liberty Street, for two-story pier, 1050 ft. long, adjoining Pier No. 9, to replace a structure destroyed by fire some time ago. Installation will include five elevators, conveying and other mechanical-handling equipment and will cost close to $2,500,000.

Central Foundry Co., 420 Lexington Avenue, New York, a subsidiary of Universal Pipe & Radiator Co., same address, has awarded general contract to Paul M. Sterling, 230 Park Avenue, for one-story foundry in Bronx, to cost over $50,000 with equipment.

Hydro Engineering & Chemical Co., New York, recently organized as a subsidiary of Standard Oil Co. of New Jersey, 26 Broadway, to develop new hydrogenation process of gasoline manufacture, has work under way on new refining unit of such type at Bayway, Elizabeth, N. J., to cost over $500,000 with equipment. Company has also leased part of former plant of Durant Motor Co., Newark, for engineering division.

Shell Eastern Petroleum Products Co., Inc., 122 East Forty-second Street, New York, has asked bids on general contract for a one-story and basement addition to plant at Sewaren, N. J., 55 x 70 ft., to cost about $35,000. H. S. Bell, Woolworth Building, New York, is architect.

Max Siegel and George H. Levy, 391 East 149th Street, New York, architects, have awarded general contract to York Building Co., 151 West Forty-second Street, for two-story automobile service, repair and garage building, to cost about $100,000 with equipment.

International Salt Co., 475 Fifth Avenue, New York, has arranged for increase in capital from $6,000,000 to $24,000,000, $100 par value capital stock, part of proceeds to be used for acquisition of Sterling Salt Co., 29 Broadway, with mines and plant at Halite, N. Y., and for extensions and improvements in this and other properties.

Lowe Paper Co., River Road, Ridgefield, N. J., has plans for a one-story and basement addition, 46 x 115 ft., to cost over $60,000 with equipment. Fred L. Smith, 21 East Fortieth Street, New York, is architect and engineer.

Allied Products Corporation, 4646 Lawton Avenue, Detroit, manufacturer of punches, dies, etc., has leased two-story building at Frelinghuysen Avenue and Hunter Street, Newark, for new branch plant.

Maurice C. Cennert, Orange, N. J., has leased part of factory at 436 Tompkins Street for new plant to manufacture medium-priced cameras and equipment.

Jersey City Ladder Co., Inc., 677 Montgomery Street, Jersey City, N. J., will take bids early in July for two-story and basement plant, 45 x 140 ft., to cost over $45,000 with equipment. Barney Singer, 921 Bergen Avenue, is architect.

Flakice Co., 205 Water Street, Brooklyn, N. Y., manufacturer of ice-making equipment and machines, has leased one-story factory at 574 Ferry Street, and will remodel for branch plant. Brooklyn factory will be maintained as heretofore.

Philadelphia

PHILADELPHIA, June 23.—Becker, Smith & Page, Inc., Water Street and Snyder Avenue, Philadelphia, manufacturer of wall papers, etc., has plans for new two and four-story addition, estimated to cost about $100,000 with equipment. Ballinger Co., Twelfth and Chestnut Streets, is architect and engineer.

Standard Oil Co. of Pennsylvania, Ledger Building, Philadelphia, has awarded general contract to W. W. Lindsay Co., 4 South Fifteenth Street, for new storage and distributing plant, to cost over $200,000 with equipment.

Shell Eastern Petroleum Products Co., 122 East Forty-second Street, New York,

has acquired about 2½ acres on Luzerne Street, from G to I Streets, and is considering new oil storage and distributing plant, to cost over $150,000 with equipment.

Power equipment, conveying and other machinery will be installed in three-story addition to confectionery factory of Minter Brothers, Inc., 5048-50 Merion Avenue, Philadelphia, for which general contract has been let to William R. Dougherty, 1610 Sansom Street, to cost over $75,000 with equipment. Clarence E. Wunder, 1520 Locust Street, is architect.

Acme Brass & Bronze Foundry, Inc., Philadelphia, has been organized with a capital of $50,000, to take over and expand Acme Brass Foundry Co., 4317 North American Street, manufacturer of brass, bronze and other metal castings. New organization is headed by Abraham H. Wineland and Anthony H. Scherer, 6313 Bingham Street; last-noted is treasurer.

Ad-Tissue Corporation, Stanton, Del., plans rebuilding part of paper mill destroyed by fire June 19.

DeLaval Steam Turbine Co., North Clinton Avenue and Pennsylvania Railroad, Trenton, N. J., manufacturer of turbine engines, compressors, pumps, etc., will hold in temporary abeyance erection of addition for storage and distribution, to cost over $40,000 with equipment, for which general contract recently was let to John W. Ferguson Co., Paterson, N. J.

Cumberland County Gas Co., Bridgeton, N. J., will dispose of bond issue of $800,000, part of fund to be used for extensions and improvements in artificial gas plants and system.

Borough Council, Chambersburg, Pa., has authorized extensions and improvements in municipal electric light and power plant to cost $67,650, including installation of coal-pulverizing equipment and other machinery.

Moul-Hesson Corporation, Hanover, Pa., recently formed by A. G. and H. C. Moul, Hanover, plans operation of local plant for manufacture and repair of canning machinery and kindred equipment. C. M. Hesson, Hanover, will be an official of new company; A. G. Moul is treasurer.

B. F. Goodrich Co., Akron, Ohio, will take bids at once on general contract for one and two-story factory branch and distributing plant, L-shaped, 75 x 95 ft., at Harrisburg, Pa. Company engineering department is in charge.

New England

BOSTON, June 23.—The machine tool market appears duller than ever, principally for the reason that manufacturers refuse to negotiate for future needs until business conditions improve. This attitude on the part of buyers is disturbing in view of the fact that there has come a turn for the better in some New England industrial plants, particularly in Connecticut and at certain Massachusetts centers.

Used tool dealers, although for from active, are busier than new tool dealers. Orders for small tools show some improvement.

Somerville Auto Body Co., 643 Broadway, Somerville, Mass., has started preliminary work on a repair shop, to cost $15,000 without equipment.

The Crane Market

A FAIR volume of inquiry for electric overhead and locomotive cranes continues to accumulate, but only a small volume of buying is reported by most sellers. The largest inquiry in the market at present is from the Board of Transportation, New York, which will open bids July 8 on a list of equipment for the 207th Street yards of the new subway. The list includes nine 5-ton, five 30-ton, two 3-ton and one 15-ton electric traveling cranes, one electric locomotive crane, a 1½-cu. yd. clamshell bucket, ten 3-ton industrial trailer trucks, two 1½-ton industrial tractor trucks, two 2-ton dump body industrial trailer trucks of ½-cu. yd. capacity, 48 car body supports, two car body and three car truck slings, six slings for mounting motors, one sling for truck frames and one for handling trucks and axles.

In the Chicago district, T. L. Durocher Co., Detour, Mich., has closed with the Orton Crane & Shovel Co. on a 50-ton steam operated, standard gage locomotive crane. The A. O. Smith Corporation, Milwaukee, has bought a 20-ton, overhead electric crane with 5-ton auxiliary.

City of Holyoke, Mass., is having plans drawn for a vocational school. Metal working, blacksmith shop and tinners' equipment is under consideration.

City of Cumberland, R. I., has closed bids on a senior high school addition to contain vocational shops, to cost $100,000 without equipment.

Atlantic Coal Co., Providence, R. I., has started work on eight coal pockets and a hoist house. Company is considering purchase of conveying equipment.

Foxboro Co., Foxboro, Mass., gages and thermometers, has awarded a contract for two three-story additions.

Mexican Petroleum Corporation, Park Square Building, Boston, with headquarters at 122 East Forty-second Street, New York, has plans for new oil storage and distributing plant at Chelsea, Boston, to cost over $150,000 with equipment. A. M. McKean is company architect, New York headquarters.

Fisk Rubber Co., Chicopee Falls, Mass., is arranging to concentrate all automobile tire production at local mill, and such operations now carried out at branch mill at Cudahy, Wis., will be transferred to first noted location. Cudahy mill will be used in future for manufacture of bicycle tires, rubber sundries, etc.

Bell Auto Body Co., Boston, recently organized by Louis Barsky, 82 Winthrop Street, Rosbury, Boston, and associates, plans operation of local plant for manufacture and repair of automobile bodies. Morris Wilson will be president.

Vulcan Tool Mfg. Co., 41 Liberty Street, Quincy, Mass., manufacturer of stone-cutting and finishing tools, etc., has awarded general contract to Clark & Smith, 13 Temple Street, for one-story addition, including improvements in present plant, to cost about $30,000.

Board of Education, Pawtucket, R. I., will soon take bids on general contract for new junior high school, with manual training department, to cost about $500,000. Robert C. N. Monahan and Robert R. Meikle, Pawtucket, are architects.

Anaconda Wire & Cable Co., 25 Broadway, New York, a subsidiary of Anaconda Copper Mining Co., same address, has purchased plant and business of Weill-Barnfield Corporation, Providence, R. I., manufacturer of kindred products. Lacquer process department of acquired plant will be removed to a new building and capacity increased.

Mackay Radio & Telegraph Co., 67 Broad Street, New York, a subsidiary of International Telephone & Telegraph Corporation, same address, has purchased 127 acres near St. George River, Cushing, Me., and will build new trans-Atlantic radio station, including power house, broadcasting plant, steel towers, etc., to cost over $200,000.

Edward T. P. Graham, 171 Newbury Street, Boston, architect, will soon take bids on general contract for three-story automobile service, repair and garage building at Cambridge, Mass., to cost over $150,000 with equipment.

South Atlantic

BALTIMORE, June 23.—Commercial Pigments Corporation, Curtis Bay, Baltimore, manufacturer of paint pigments, etc., has awarded general contract to United Engineers & Constructors, Inc., 112 North Broad Street, Philadelphia, for additions to cost about $500,000 with equipment. Power house will be enlarged and additional equipment installed. Company is operated by Commercial Solvents Corporation, 230 Park Avenue, New York.

Bureau of Yards and Docks, Navy Department, Washington, is asking bids for one-story smelting plant, 57 x 102 ft., with steel crane runway, at local navy yard.

Whaley Aircraft & Engineering Corporation, Norfolk, Va., Edward A. Whaley, head, is negotiating with I. W. Truxton, city manager, for lease of about 185 acres for construction and operation of municipal airport, including hangars, repair and reconditioning shop, and other units.

Arlington County Board of Education, Rosslyn, Va., Fletcher Kemp, superintendent, is considering installation of manual training equipment in addition to Washington Lee High School, for which a bond issue of $255,000 has been authorized. Architect will be selected soon.

Southern Mineral Products Corporation, a subsidiary of Vanadium Corporation of America, Inc., Oliver Building, Pittsburgh, has awarded contract to Stone & Webster, Inc., Boston, engineer and contractor, for design and construction of new plant near Afton, Amherst County, Va., about 50 miles from Lynchburg, where more than 2000 acres has been secured. Project will consist of several units for production of ilmenite and other minerals used in titanium and kindred manufacture, to cost over $1,000,000 with machinery. Development will include a power house and machine shop.

Pocahontas Fuel Co., Pocahontas, Va., W. A. Bishop, chief engineer, is planning construction of new tipple at coal-mining properties near Crockett's Cove, W. Va., to cost over $200,000 with machinery.

City Council, Elberton, Ga., is considering plans for a municipal hydroelectric generating plant, to cost more than $80,000 with equipment. H. S. Jaudon Engineering Co., Elberton, is engineer.

Board of Trustees, Maryland Training School for Boys, Lock Raven, Md., has awarded general contract to Davis Construction Co., 9 West Chase Street, Baltimore, for two and three-story addition,

135 x 192 ft., part of unit to be used as a vocational school, to cost over $225,000 with equipment.

Washington Railway & Electric Co., Fourteenth and C Streets, Washington, has awarded general contract to Shinker & Garrett, 1719 I Street, N. W., for two-story automobile service, repair and garage building, to cost about $375,000 with equipment. A. B. Heaton, 1211 Connecticut Avenue, N. W., is architect.

B. F. Huntley Furniture Co., Patterson Avenue, Winston-Salem, N. C., a division of Simmons Co., Kenosha, Wis., manufacturer of brass bedsteads, springs, etc., is planning addition to furniture factory, to cost over $150,000 with equipment.

Pittsburgh

PITTSBURGH, June 23.—Business has been extremely quiet in machine tools the past week and little real activity is expected during the next two months. An inquiry is looked for shortly from the Westinghouse Electric & Mfg. Co. for about 20 items, and the trade derives a measure of confidence in the fact that there are many big projects involved in the use of machine tools that are likely to materialize some time during the remainder of the year. General business conditions are likely to determine how promptly these jobs will go forward. Demand for the heavier lines of machinery also is slow. Repair parts for cranes are selling fairly well.

Equitable Meter Co., 400 Lexington Avenue, Pittsburgh, manufacturer of gas meters, parts, etc., a division of Pittsburgh Equitable Meter Co., has awarded general contract to J. F. Haldeman, 5941 Baum Boulevard, for one-story additions, 60 x 320 ft., and 45 x 120 ft., to cost over $100,000 with equipment.

Water Commission, Baden, Pa., will receive bids until June 30, for one steel water tank, 27 ft. diameter, and 60 ft. high.

Officials of Gulf Oil Corporation, Frick Annex, Pittsburgh, have organized Union Gulf Corporation, a subsidiary, to construct and operate refineries and pipe lines. Company is acquiring Paragon Refining Co., Cincinnati, with main plant at Toledo, and will increase capacity from 7000 to 20,000 bbl. daily, at a cost of over $5,000,000 with machinery. Tract of 120 acres has been purchased on Neville Island, Pittsburgh, as site for refinery, for which plans will be drawn at once, to cost more than $4,500,000. A refinery will also be operated at Cincinnati. These plants will be used in conjunction with pipe line to be constructed from Eason, Okla., to three points noted, to cost more than $25,000,000 with pumping and power stations and other mechanical equipment. Work is scheduled to begin on pipe line in July. New company has arranged for a bond issue of $60,000,000, part of fund to be used for construction and development. W. L. Mellon is president, and also head of parent organization.

West Virginia Power & Transmission Co., 14 Wood Street, Pittsburgh, an interest of West Penn Power Co., same address, has secured permission for a hydroelectric power development on Blackwater and Cheat Rivers, West Virginia, to cost over $10,000,000 with transmission lines, switching stations, etc. Plans will be prepared by Sanderson & Porter, 52 William Street, New York, engineers.

T. K. Hendryx, Tidewater Building, Bradford, Pa., architect, has plans for a one and four-story automobile service, repair and garage building, 115 x 200 ft., to cost about $140,000 with equipment.

Equitable Gas Co., 435 Sixth Avenue, Pittsburgh, is planning expansion, including development of new natural gas properties in southwestern Pennsylvania and West Virginia. Work has begun on new gasoline refinery at Rogersville, Pa. Entire program will cost about $400,000.

Buffalo

BUFFALO, June 23.—S. B. Whistler & Sons, Inc., 1459 Niagara Street, Buffalo, manufacturer of sheet metal stampings, dies, tools, etc., has awarded general contract to Jacob Klein, 38 Vulcan Street, for one-story machine shop, to cost about $30,000 with equipment. E. Ellsworth Short, 261 Summit Avenue, is architect.

Gulf Refining Co., Frick Annex, Pittsburgh, will build an oil storage and distributing plant on 5-acre tract at Rochester, N. Y., recently acquired, with initial capacity of 300,000 bbl., to cost over $400,000 with pumping plant, pipe lines, loading equipment, etc.

Corry Metal Corporation, Jamestown, N. Y., has been organized, to take over and expand Corry-Jamestown Mfg. Corporation, Corry, Pa., manufacturer of metal furniture, filing cabinets, etc. Incorporators include Carl E. Windahl, superintendent of former company, 272 West Washington Street, Corry; and Ralph E. Larson, sales manager of former organization.

Board of Supervisors, Court House, Ithaca, N. Y., has asked bids on general contract for one-story equipment storage and distributing plant, to cost about $35,000 with equipment. H. C. Thorne, 139 East State Street, is architect.

Board of Education, Niagara Falls, N. Y., will build two new multi-story junior high schools with manual training departments, instead of one as previously announced, and has authorized sale of bonds for $1,700,000 to provide for new units, including equipment. Cannon & Kirkpatrick, United Office Building, are architects.

Detroit

DETROIT, June 23.—Wire & Wood Wheel Corporation, 317 Oak Street, Jackson, Mich., recently organized with capital of $25,000, is arranging for early operation of plant for manufacture of wheels for rolling chairs, infant carriages and other vehicles. O. W. Mott is president, and Arthur D. Aikins, secretary, treasurer and general manager.

City Council, Sturgis, Mich., O. O. Johnson, City Hall, city manager, has plans for a municipal hydroelectric power plant, to cost about $80,000 with equipment. Ayres, Norris, Lewis & May, Cornwell Building, Ann Arbor, are engineers.

H. L. Hartley Machine Co., Owosso, Mich., manufacturer of polishing machines, recently organized, has leased local building and will remodel for new plant. W. V. Robinson, Owosso, is one of heads of company.

Ford Motor Co., Dearborn, will carry out an expansion and improvement program during present year to cost over $30,000,000, of which work to amount of about $24,000,000 has been placed under way or is about to start. This includes new assembling plants at Edgewater, N. J., for passenger cars, Seattle and Richmond, Cal., and at three other locations to be announced soon. Power plant at main works at Dearborn will be enlarged at cost of $1,000,000, and water tunnel, intake house and pumping station for power plant noted will be built at cost of $3,000,000. Company is carrying out expansion at local steel rolling and wire drawing mill.

City Council, Allegan, Mich., has awarded general contract to Hay, Weaver & Co., South Bend, Ind., for municipal hydroelectric power plant, power dam and spillway to cost about $190,000. Machinery installation will cost over $300,000 additional.

Colonial Oil Co., 320 Franklin Street, Grand Rapids, Mich., is considering new oil storage and distributing plant, to cost about $50,000 with equipment. Pierre Lindhout, Michigan Trust Building, is architect.

Kelsey-Hayes Wheel Corporation, 3600 Military Avenue, Detroit, manufacturer of automobile wheels, an interest of Wire Wheel Corporation of America, Inc., has acquired plant and part of equipment of Jaxon Steel Products Co., Jackson, Mich., manufacturer of rims, wheels, etc., a subsidiary of General Motors Corporation. Purchasing company operates a rim plant at Jackson and will carry out expansion in connection with acquired property.

United States Pressed Steel Co., Ypsilanti, has begun removal of machinery and equipment to new plant recently acquired at Kalamazoo, and plans to have works ready for service in July. Company plant at Ypsilanti was recently acquired by Ford Motor Co., to be used in connection with water power development.

Gabriel Steel Co., 2441 Bellevue Avenue, Detroit, has arranged for increase in capital from $250,000 common stock and $125,000 preferred, to $750,000 common, and $250,000 preferred stock, part of proceeds to be used for extensions and improvements.

Cleveland

CLEVELAND, June 23.—Machine tool business has tapered off and the past week was one of the dullest in years. As inquiry is scarce there is not much new business in prospect. A new inquiry came from the Amtorg Trading Corporation for 25 to 30 turret lathes to supplement previous purchases for the Russian tractor plant at Stalingrad. Reports from Detroit indicate that there is virtually no activity in the machine tool market in that city.

General Electric Co., Schenectady and Cleveland, has awarded general contract through subsidiary, General Electric Realty Corporation, 120 Broadway, New York, to Sam W. Emerson Co., 1836 Euclid Avenue, Cleveland, for two and three-story factory branch and distributing plant, 210 x 300 ft., at Cleveland, to cost over $450,000 with equipment.

Schill Brothers Co., Crestline, Ohio, manufacturer of domestic heating furnaces, is considering one-story foundry addition, to cost about $45,000 with equipment.

Mohawk Rubber Co., Akron, Ohio, manufacturer of automobile tires, tubes, etc., has arranged for an increase in capital

from 125,000 to 150,000 shares of stock, no par value, part of proceeds to be used for expansion.

Schultz Die Casting Co., Toledo, Ohio, care of Fraser, Hiett, Wall & Effler, Home Bank Building, attorneys, recently organized with capital of $40,000 and 5000 shares of stock, no par value, plans early operation of local plant for production of die-castings and other equipment. New company is headed by J. A. Schultz, formerly vice-president and general manager for Doehler Die Casting Co., with local plant on Smead Avenue.

Firestone Tire & Rubber Co., Akron, Ohio, will take bids on general contract for two-story factory branch, service and distributing plant at Toledo, Ohio, to cost about $100,000 with equipment. Company engineering department is in charge.

Lake Erie Public Service Co., Toledo, has secured permission to acquire power plant and properties of Toledo, Fostoria & Findlay Railway Co., 520 Huron Street, including electric light and power facilities and business, and to issue stock in amount of $327,200, part of proceeds to be used for purchase and proposed extensions and improvements.

Fisher Body Co., General Motors Building, Detroit, has awarded general contract to J. A. Utley, 700 Harper Avenue, Detroit, for one-story addition, 85 x 400 ft., to plant at Cleveland, for die-stamping, and adjoining one-story distributing building, 30 x 100 ft., to cost over $275,000 with equipment.

Chicago

CHICAGO, June 23. — Hold-up orders are beginning to be a troublesome factor in this market. Chief among these is a suspension of orders on a sizable list of shop tools for the Milwaukee Road. Simultaneously this railroad is requesting figures on a 24-in. lathe and an upright drill. The Caterpillar Tractor Co., Peoria, Ill., has placed a few machine tools and still has on its program the purchase of a large list.

Swift & Co., Chicago, have ordered a radial drill. Chicago Board of Education is taking figures on two 11-in. x 4-ft. motor driven lathes, several 8-in. grinders, two sensitive drills and two complete sets of tinners tools for Wright and Amundsen high schools. A long list is still pending for Austin High School and many machine tools will be required for Lane Technical High School, for which ground has been broken. Taken as a whole, however the market is quiet with nothing in prospect to indicate an upturn in the normally dull summer months.

Jones Superior Machine Co., 1258-70 West North Avenue, Chicago, has awarded general contract to McKeown Brothers Co., 112 West Adams Street, for one-story addition, 45 x 125 ft., to cost about $40,000 with equipment. Alfred E. Strobel, 192 North Clark Street, is architect.

David H. Feder Corporation, 329 West Grand Avenue, Chicago, manufacturer of roof cements, paints, etc., has purchased plant of North American Packing Co., at Madison and Rockwell Streets, totaling about 30,000 sq. ft. floor space, and will remodel for new plant.

Northern States Power Co., Minneapolis, Minn., has authorized plans for an addition to local Riverside steam-operated electric generating station, to cost over $1,500,000. Company is operated by Byllesby Engineering & Management Corporation, 231 South La Salle Street, Chicago, and engineering department of last noted organization will be in charge.

Northwest Paper Co., Cloquet, Minn., has awarded general contract to James Leek Co., Minneapolis, for additions, for expansion in machine department, beater house and finishing division, to cost over $1,000,000 with machinery. Jacob Engineering Co., Minneapolis, is engineer.

Baker Iron Co., 1724 East Franklin Avenue, Minneapolis, has awarded general contract to Pike & Cook, 416 South Fourth Street, for new one and two-story plant, to cost about $45,000 with equipment. J. V. Vanderbilt, 1645 Hennepin Avenue, is architect.

Hunt, Helm & Ferris Co., Harvard, Ill., manufacturer of dairy and barn equipment, conveyor systems, etc., will soon begin superstructure for a one-story and basement addition, to cost about $40,000 with equipment. W. Schulzke, Peoples' Bank Building, Moline, Ill., is architect.

Board of Trustees, Joliet Township High School, Jefferson Street, Joliet, Ill., is planning installation of manual training equipment in new high school addition, to cost about $500,000. Burnham Brothers, Inc., 160 North La Salle Street, Chicago, is architect.

Whelco Laundry Machinery Co., Fifty-fourth Street, Chicago, is planning to rebuild part of plant recently destroyed by fire, with loss estimated over $60,000 including equipment. Plant of City Iron Works, on adjoining property, was also damaged in same fire to extent of about $50,000 with equipment. It is proposed to rebuild.

Northwestern Light & Power Co., Cedar Rapids, Iowa, is considering extensions and improvements in steam-operated electric power plant at Grundy Center, Iowa, including installation of equipment, to cost over $50,000.

Clay Equipment Corporation, Cedar Falls, Iowa, manufacturer of farm equipment, is completing an addition, 80 x 100 ft., for a sheet metal department.

J. E. Huffman, Madison, Wis., and associates of Genoa, Ill., will establish a plant at Genoa to manufacture dies, molds, vacuum cleaners and other metal products.

Rotary Plow Co., Seattle, Wash., has leased part of former Illinois Thresher Co.'s plant at Sycamore, Ill., for establishment of a Mid-Western branch pattern works.

Milwaukee

MILWAUKEE, June 23.—While the past week witnessed slight improvement in inquiry, the dearth of actual orders continues to limit volume. However, production schedules are being well maintained at most plants, enough new business coming to offset deliveries. An encouraging sign in the general situation is that some manufacturers of metal products report better orders and are recalling a small part of men recently laid off.

Chicago, Milwaukee, St. Paul & Pacific Railway has placed general contract with James Stewart Corporation, 343 South Dearborn Street, Chicago, for a $250,000 addition to Elevator E at Milwaukee. C. F. Loweth is chief engineer.

Bentley Brothers, Inc., 808 South Pierce Street, Milwaukee, has general contract for an extension, 80 ft. sq., to erecting shop of Norberg Mfg. Co., Oklahoma and Chase Avenues.

Three 75-ton furnaces and two 5-ton electric traveling cranes are principal items of equipment specified in plans for a $400,000 addition to municipal garbage incinerating plant at Milwaukee. Bids on general contract will close about July 1. David McKeith is commissioner of public works. C. E. Malig is municipal architectural engineer.

Foeller, Schober & Berners, architects, 302 Pine Street, Green Bay, Wis., have been commissioned by Board of Education, Port Washington, Wis., to design new $150,000 city high school. Vocational training departments will be included. John E. Gilson is president of board.

Public Utility Commission, Marshfield, Wis., is taking bids until July 8 for complete installation of new steel standpipe type of water storage tank, 25 ft. diameter and 120 ft. high. George Marvin is secretary of commission.

Chicago & North Western Railway has placed general contract with John S. Metcalf Co., 111 West Jackson Boulevard, Chicago, for an addition, 108 x 310 ft., to Kinnickinnic elevator and workhouse, Milwaukee, to cost about $500,000.

Badger Carton Co., 387 Ninth Street, Milwaukee, has purchased plant and property of Hamilton Aero Mfg. Co., Concordia Avenue and Bremen Street, for $150,000 and will equip main building, 135 x 477 ft., one-story, as new production unit. Hamilton company, manufacturer of airplane propellers, is now operating at Pittsburgh, with other propeller divisions of United Aircraft Corporation. Henry J. Hanauer is general manager of Badger Company.

Board of Regents, State Teachers' Colleges of Wisconsin, Madison, will soon call for bids for construction and equipment of new central heating plant and gymnasium at State Teachers' College, Milwaukee, for which an appropriation of $230,000 has been released. Arthur Peabody is State architect. Frank E. Baker is president of Milwaukee college.

Kearney & Trecker Corporation, Milwaukee, manufacturer of milling machines, has 850 persons at work, compared with a top peak of 925 and is operating three shifts a day. Current production compares favorably with that of 1928 and is only 10 per cent below record volume of last year. While company sold far ahead last year and is still getting out these orders, it has had no cancellations, new business is good, and prospects are encouraging, according to Theodore Trecker, president. Orders indicate that fruit and vegetable canning industry will be especially busy this season.

Indiana

INDIANAPOLIS, June 23. — General Electric Co., Broadway, Fort Wayne, headquarters at Schenectady, N. Y., has awarded general contract to Indiana Engineering & Construction Co., Central Building, for one-story addition, to cost about $40,000 with equipment.

National Consumers Oil Co., Inc., Terre Haute, is contemplating new compounding, storage and distributing plant at Louisville, to cost over $200,000 with equipment.

L. G. S. Mfg. Co., 2571 Cornell Avenue, Indianapolis, manufacturer of machine equipment and mechanical products, has arranged for reorganization and expansion, with capital of $100,000. Company is headed by E. L. Cord, L. B. Manning, Raymond S. Pruitt and Albert Leiber. L. G. S. Devices Corporation, an affiliated organization, headed by same interests, has also filed notice of reorganization,

with capital of $30,000, to manufacture mechanical devices.

Mullins-Gibson Mfg. Co., Rushville, manufacturer of tractor clutches and other mechanical equipment, has awarded general contract to W. C. Bishop, Rushville, for one-story foundry unit, 45 x 75 ft., to replace part of plant recently destroyed by fire, to cost about $30,000 with equipment. Frank Mullins is general manager.

Independent Concrete Pipe Co., 201 North West Street, Indianapolis, with plant on North Sherman Drive, has arranged for increase in capital to $525,000, part of proceeds to be used for expansion.

Chicago Mica Co., and Fibroc Insulation Co., Valparaiso, Ind., and Continental-Diamond Fibre Co., Newark, Del., have been merged, according to L. T. Frederick, president of Fibroc Insulation Co., and vice-president and general manager of Chicago company. It is planned to continue Valparaiso units as separate holdings. Victor R. Despard, who has been associated with Mr. Frederick in ownership and management of Chicago Mica and Fibroc Insulation companies, has retired.

Cincinnati

CINCINNATI, June 23.—The machine tool market is quiet and featureless. Demand last week was about on a parity with the preceding week, but the volume of inquiry is diminishing as consumers continue to follow a conservative policy. With production considerably less than capacity, many plants will welcome the opportunity to close for vacation periods.

American Laundry Machinery Co., Ross and Section Avenues, Norwood, Cincinnati, has acquired laundry machinery division of General Laundry Machinery Co., 822 West Washington Boulevard, Chicago, and will consolidate. Expansion will be carried out by purchasing company, including operation of additional branch factories. General company is arranging for change of name to Tolhurst Corporation and will concentrate in future on production of centrifugal machines for automobile, textile, chemical and other industries.

Hilton-Davis Co., Langdon Road, Cincinnati, manufacturer of industrial chemicals, etc., has plans for two-story addition to cost about $55,000 with equipment. Joseph G. Steinkamp & Brothers, Mercantile Library Building, are architects.

Palmer Asbestos & Rubber Corporation, 2741 Clybourn Avenue, Chicago, has acquired five acres at St. Matthews, a suburb of Louisville, as site for new mill to manufacture rubber goods, brake band products, industrial packings, etc. Initial unit will be two stories, to cost over $200,000 with machinery. Other structures will be built later for total investment of over $750,000.

Watauga Stone Co., Watauga, Tenn., recently organized by Howard Young, Nashville, Tenn., and associates, has begun construction of new plants in Carter County, consisting of limestone quarry near Watauga for production of crushed stone, and washed sand plant near Siam, to cost more than $100,000 with crushing, conveying, loading, mechanical washing and other equipment.

Construction Quartermaster, Wright Field, Dayton, Ohio, is asking bids until July 12 for foundry, wood shop extension, wind tunnel building, armament laboratory, radio laboratory, maintenance building and oil house at local field. Material Division, Wright Field, will receive bids until July 7 for 88 fuel pump assemblies, 555 gun mounting post assemblies, 515 trigger motor assemblies and other mechanical equipment.

Paragon Tool & Supply Co., Third and Madison Streets, Dayton, Ohio, was recently organized by W. R. Kemper, T. E. Fritch and F. B. Moorman to deal in millfactory and contractor's supplies.

Additions to plant and equipment, which will increase production of Tube-Turns, Inc., Louisville, Ky., by 60 per cent, were announced by Walter H. Girdler, president of Girdler Corporation, which operates Tube-Turns company, manufacturer of seamless forged, short-radius, uniform wall fittings for pipe welding. Expansion has been made necessary by increased business; sales for first five months of 1930 were 271 per cent more than in corresponding period last year. For several weeks plant has been operating 24 hr. a day.

North Side Foundry Co., 537 Collins Avenue, Columbus, Ohio, manufacturer of gray iron castings, has recently been taken over and operated by J. G. Harding.

Gulf States

BIRMINGHAM, June 23. — Bogalusa Paper Co., Bogalusa, La., has awarded general contract to H. J. Cowgill, Bogalusa, for one-story machine room addition to corrugated paperboard mill, 45 x 335 ft., to cost over $100,000 with equipment.

Phillips Petroleum Co., Bartlesville, Okla., has approved plans for new gasoline refinery near Badger, Tex., to cost over $1,000,000 with machinery. This is part of general expansion program of company which will include construction of number of similar units of smaller capacity in Texas, Oklahoma and New Mexico districts.

Edward Friedrich, 1117 East Commerce Street, San Antonio, Tex., manufacturer of refrigerators and equipment, has taken out a permit for a three-story addition, totaling about 50,000 sq. ft. of floor space, to be used in part for assembling, to cost over $85,000 with equipment.

Saxet Co., Houston, Tex., operating oil and natural gas properties, with wells and other holdings in White Point, Saxet, Rufugio fields in south Texas, is disposing of a bond issue of $5,000,000, part of fund to be used for extensions and improvements.

Houston Oil Co., Houston, Tex., has work under way on new refinery near Corpus Christi, Tex., to cost over $350,000 with machinery. Company is planning construction of oil storage and distributing plant at same location, also pipe line from Mirando field.

Birmingham Electric Battery Co., 2230 Second Avenue, Birmingham, manufacturer of electric storage batteries, etc., has asked bids on general contract for two-story factory, 25 x 140 ft., to cost more than $70,000 with equipment. William Leslie Wilton, American Trust Building, is architect.

Houston Pipe Line Co., Houston, Tex., affiliated with Houston Oil Co., Houston, has arranged for increase in capital from $15,000,000 to $25,000,000, part of proceeds to be used for expansion in pipe lines and other production and distributing facilities.

Sunflower Cotton Oil Co., Indianola, Miss., has authorized a new one-story plant, to replace part of mill recently destroyed by fire, to cost over $80,000. Electric-operated machinery will be installed. E. M. Murray is construction engineer, in charge.

Goslin-Birmingham Mfg. Co., Birmingham, manufacturer of iron and steel products, has work under way on one-story shop addition, to cost over $40,000 with equipment.

Shell Petroleum Products Co., Shell Oil Building, St. Louis, operated by Shell Oil Co., same address, is considering new oil storage and distributing plant at Orange, Tex., to cost over $70,000 with equipment.

Cosden Refining Co., Big Spring, Tex., has approved plans for addition to oil refinery about 3 miles from Big Spring, to cost about $85,000 with machinery.

Champion Coated Paper Co., Hamilton, Ohio, has purchased property at Tuscaloosa, Ala., and is considering construction of new paper and pulp mill, to cost over $5,000,000 with machinery. Project will include a power house and machine shop. Company has also been inspecting sites near Mobile, Ala., for proposed plant. L. G. Thomson is secretary and treasurer.

Board of Education, Laredo, Tex., plans installation of manual training equipment in new high school to cost about $250,000, for which plans have been completed by Giesecke & Harris, Austin, Tex., architects.

St. Louis

ST. LOUIS, June 23.—Matthews Electric Corporation, 3722 Forest Park Boulevard, St. Louis, manufacturer of electrical equipment, has awarded general contract to Murch Brothers Construction Co., Railway Exchange Building, for a two-story addition, 20 x 95 ft., to cost about $35,000 with equipment.

Stearman Aircraft Corporation, 601 East Thirty-fifth Street, Wichita, Kan., has awarded a general contract to Austin Co., Cleveland, for new plant consisting of several one-story units, two-story administration building, power plant and gate house, to cost over $200,000 with equipment. Lloyd Stearman is president.

United Power & Light Corporation, Abilene, Kan., has arranged for a bond issue of $1,500,000, part of proceeds to be used for extensions and improvements in power plants and system.

Nebraska-Iowa Grain Co., Omaha, Neb., is planning to rebuild part of grain elevator recently destroyed by fire, with loss estimated over $200,000 including machinery.

Missouri Portland Cement Co., Telephone Building, St. Louis, contemplates new mill near Tulsa, Okla., to cost about $2,000,000 with machinery. Project will include power house and machine shop.

State Board of Agriculture, State Capitol Building, Oklahoma City, Okla., is asking bids on general contract until July 8 for one-story mechanical building, 62 x 82 ft., at institution at Goodwell, Okla., to cost about $30,000 with equipment. Layton, Hicks & Forsyth, Braniff Building, Oklahoma City, are architects.

Board of Education, Havensville, Kan., has plans for one-story vocational building at local school, to cost about $45,000 with equipment. Frank C. Squires, 630 Kansas Avenue, Topeka, Kan., is architect.

Cargill Grain Co., Minneapolis, has begun construction of a new grain elevator at Omaha, Neb., with capacity of

5,000,000 bu., to cost over $1,500,000 with elevating, conveying, screening and other mechanical equipment.

Welded Products Corporation, Seventeenth and Cleveland Avenues, Kansas City, Mo., has acquired property at Independence and Topping Avenues, as site for new one-story plant, to cost over $60,000 with equipment. Fred Michaelis, 114 West Tenth Street, is architect.

Vulcan Mfg. Co., Fifteenth and Chestnut Streets, Kansas City, Mo., manufacturer of laundry machinery and parts, has leased a three-story and basement factoy at 2006-12 Wyandotte Street, and will remodel for new plant.

Haskins Brothers Co., Omaha, Neb., has plans for a power house at factory, to cost about $55,000 with equipment. Federal Engineering Co., Central Office Building, Davenport, Iowa, is architect and engineer.

Canada

TORONTO, June 23.—Work house of Union Terminal Elevator Co., Port Arthur, Ont., destroyed by fire June 11 will be rebuilt, and a 1,000,000 bu. elevator addition also erected. Program will involve expenditure of $1,250,000.

Canadian Richards-Wilcocks Co., London, Ont., will build a one-story addition to cost $35,000.

W. A. Jenkins Co., Ltd., London, Ont., has plans for a four-story addition, to cost $50,000.

Tenders are being received, no closing date, by F. S. Mallory, architect, 11 Roseberry Avenue, Toronto, for a one-story addition to plant of Canada Foil, Ltd., 35 Fraser Avenue, to cost $30,000.

Canadian Industries, Ltd., 1050 Beaver Hall Hill, Montreal, has awarded contract to Anglin-Norcross, Ltd., Temple Building, Toronto, for a manufacturing plant at Hamilton, Ont., to cost $100,000.

George W. Reed & Co., Ltd., 779 St. Antoine Street, Montreal, subsidiary of Western Steel Products, Ltd., has awarded contract to Church, Ross Co., Ltd., 1440 St. Catharine Street West, for a roofing and sheet-metal manufacturing plant, to cost $400,000. T. Pringle & Sons, Ltd., 410 St. Nicholas Street, is engineer.

Western Canada

Crossman Electrical Machinery Co., 5062 Alexander Street, Vancouver, B. C., has awarded general contract to Dominion Construction Co., 509 Richard Street, for a two-story addition, 50 x 67 ft., to cost $11,000.

Municipal power plant at Radisson, Sask., recently destroyed by fire will be rebuilt and new equipment will be purchased.

Pacific Coast

SAN FRANCISCO, June 19.—Stockton Fire Brick Co., Russ Building, San Francisco, manufacturer of fire brick, refractory shapes, etc., has plans for new works on 25-acre tract at Pittsburg, Cal., with power house, machine shop and other buildings, to cost over $450,000 with equipment. K. Theill, 580 Market Street, San Francisco, is engineer.

J. D. Wright, 1331 East Third Street, Long Beach, Cal., is at head of project to construct and operate a new one-story plant at Huntington Beach, Cal., for production of white lead, red lead and kindred specialties, to cost about $60,000 with equipment.

De La Salle Institute, Martinez, Cal., operated by Christian Brothers, has acquired about 350 acres at Napa, Cal., as site for new training school for boys, including vocational and other instruction, to cost close to $100,000 with equipment.

Los Angeles Soap Co., Los Angeles Railway Building, Los Angeles, has awarded general contract to Consolidated Steel Corporation, 1200 North Main Street, for one-story plant unit at Wilmington, Los Angeles Harbor, 40 x 340 ft., primarily as a seed-crushing mill, with rollers, conveyors and other machinery, to cost about $65,000.

Central Arizona Light & Power Co., Phoenix, Ariz., has arranged for a bond issue of $7,500,000, part of proceeds to be used for extensions and improvements in power plants and system. Company is operated under direction of Electric Bond & Share Co., 2 Rector Street, New York.

Dallas Machine & Locomotive Works, Dallas, Ore., recently organized, has plans for a foundry, 50 x 75 ft., as initial unit of new plant at Klamath Falls, Ore., to cost about $40,000.

Department of Utilities, Tacoma, Wash., will soon take bids on general contract for municipal steam-operated electric power plant, 96 x 105 ft., to cost about $350,000 with machinery. J. L. Stannard is chief engineer.

American Boiler Works, Inc., Everett, Wash., care of Alexander McK. Vierhus, First National Bank Building, attorney, recently organized, is planning operation of local boiler and plate works, for manufacture of stationary and marine mechanical equipment. Company is headed by Philip Foubert and Martin Bering.

Traveling ovens, power equipment, conveying and other machinery will be installed in new two-story plant to be constructed by Langendorf United Bakeries, Inc., Seattle, to cost $160,000, for which building contract has been let to Barrett & Hilp, 918 Harrison Street, San Francisco.

Foreign

GENERAL contract has been let by Cemento Portland Nacional, Hermosillo, Sonora, Mexico, to MacDonald Engineering Co., 149 California Street, San Francisco, for design and construction of new cement mill at Hermosillo, with capacity of 500 bbl. daily, to cost about $450,000 with machinery. S. A. Francisco Elias is president.

International Standard Electric Corporation, 67 Broad Street, New York, a subsidiary of International Telephone & Telegraph Corporation, same address, manufacturer of cable and electrical equipment for last-noted organization, has purchased plant and business of Aktieselskap Skandinaviske Kabel og Gummifabrikkers (Scandinavian Cable & Rubber Co.), Oslo, Norway, and will operate as unit of organization. Plans are under way for complete modernization and increased capacity in Oslo plant.

Moto Meter Gauge & Equipment Co., 15 Wilbur Avenue, Long Island City, manufacturer of ammeters, gages, automobile instruments, etc., has begun expansion at plant in Germany for production of complete line of company instruments, panels, etc. Plans are under consideration for development of other European plants for similar extensive output. Company has secured a financial interest in F. Respassau & Co., Paris, France, French licensee of Moto Meter products, and has granted rights to manufacture and distribute entire line in that country; expansion in present output will be arranged. Similar arrangements have been made in England with Benjamin Electric, Ltd., London. R. G. Martin is president of Moto Meter company.

Central German Power Co., Magdeburg, Germany, is disposing of a note issue in United States, totaling $4,000,000, part of proceeds to be used for extensions in power plant and system.

Honolulu Iron Works, Honolulu, Hawaii, manufacturer of sugar mill machinery and equipment, has acquired controlling interest in Macfarlane Foundry & Machine Co., Sagua La Grande, Cuba, manufacturer of rollers for sugar mills and kindred machinery, and will operate as an affiliated organization. Specialties of purchasing company will be manufactured in future at Cuban plant. James Macfarlane, heretofore head of Macfarlane company will continue as general manager.

New Trade Publications

Trucks.—Colson Co., Elyria, Ohio, catalog No. L 191, 80 pages. Lists and illustrates an extensive line of trucks with all-steel and other types of platforms up to 4½-ton capacity, hand trucks, factory service box trucks, dolly trucks, trade trucks and various types of trucks for special purposes, as well as truck wheels and various types of casters.

Cadmium Plating.—The Udylite Process Co., 3220 Bellevue Avenue, Detroit. A 32-page pamphlet, beautifully illustrated, describes this process of plating materials with cadmium and discusses the source of cadmium, its protective qualities and some of its chemical and physical properties. The necessary equipment is described also.

Steel Pulleys.—American Pulley Co., Philadelphia. A catalog of 128 pages, well illustrated, describes this company's products which are made of pressed steel and include pulleys, shaft hangers, hand trucks, reels, spools and beams and miscellaneous stampings.

Ash Handling Systems.—Brady Conveyors Corporation, 20 West Jackson Boulevard, Chicago. 24-page catalog illustrating several methods of handling ash by pipe lines, as well as other types of ash conveying.

Speed Reducers.—Leaflet 20472, issued by the Westinghouse Electric & Mfg. Co., is an eight-page leaflet, describes and illustrates the new Westinghouse-Nuttall single and double reduction units for use in general industrial and mining operations. Horsepower ratings, speeds, dimensions and weights are given in tabulated form, accompanied by outline drawings.

Metal Grilles.—Harrington & King Perforating Co., Chicago. Booklet of 12 pages illustrating designs in patented grilles, which can be cut from sheets in stock and assembled for installation in any required size. Twelve standard designs are available ranging from 39 to 72 per cent open grille work.

INDEX

Illustrated articles indicated by *

A

Abbott, Charles F.:
Consumption Financed Through Wages, Feb 27 p 681

Abrasive Compound:
For Lapping Tungsten-Carbide Tools*, May 15 p 1477

Accidents:
Armco Plant Safety Record, May 1 p 1334
At Metallurgical Works, Mar 20 p 878
In Iron and Steel Industry, 1910-1928, Apr 3 p 1009
Irreducible Minimum (Editorial), Apr 17 p 1180

Acme Machine Co.:
Turret Lathe for Tungsten-Carbide Tools*, June 26 p 1906

Acme Steel Co.:
Annual Report, Jan 30 p 387
Hot-Strip Mill*, Mar 20 p 846

Airbrush:
Paasche for Applying One or More Colors*, May 15 p 1475

Aircraft:
All-Metal Airplanes, Mar 20 p 858
Alloy Steel Sheets for*, Feb 13 p 502
Construction in Sikorsky Plant*, Jan 30 p 362
Detroit Company Adopts Metal Fuselage, Apr 10 p 1082
Metal Rib Wings for Airplane*, Jan 16 p 230
Outlook for Industry, Jan 2 p 23
Parts Made of Stainless Steel, Apr 10 p 1088
Plans of Airplane Companies, Jan 9 p 163
Welding, Limitations on, Jan 23 p 297

Airplanes:
(See Aircraft)

Ajax Electrothermic Corporation:
High-Frequency Electric Furnace*, May 1 p 1301

Ajax Metal Co.:
Electric Zinc Melting Furnace*, May 1 p 1305

Ajax Mfg. Co.:
Large Upsetting Forging Machine*, May 15 p 1473

Alamo Iron Works:
Automobile Parking Space for Employees*, June 19 p 1831

Alberts, W.:
Talbot Process in Steel Furnace*, Jan 23 p 309

Alford, L. P.:
Developments in Management, Apr 10 p 1082

Algoma Steel Corporation:
To Build Rail Structural Mill, June 19 p 1830

Allegheny Iron & Metal Co.:
Hydraulic Scrap Baling Press Installation*, Mar 6 p 729

Allegheny Metal:
Culinary Utensils Made of*, Feb 6 p 445

Allen, N. P.:
Gas Content and Soundness of Copper Ingots, Mar 27 p 949

Alliance Machine Co.:
Aluminum Alloy Crane*, June 5 p 1689

Allis-Chalmers Mfg. Co.:
Mutual Aid Society*, Mar 20 p 843

Alloy Steel:
(See Also Steel)
Apso and Durapso, French Stainless, Jan 23 p 348; June 19 p 1848
Chrome-Nickel and Chromium, Drawn Stampings of*, June 12 p 1755
Chrome-Nickel Unusual Products*, June 12 p 1735
Chrome-Nickel Used in Ford Cars*, Feb 20 p 594
Chromium-Copper, French Structural, Mar 13 p 815; June 19 p 1848
For Gears*, Feb 13 p 507
Forgings of Nickel-Chromium Molybdenum, May 1 p 1341
Forgings, Snow Flakes in*, May 8 p 1380
Manganese-Chromium Structural, Feb 13 p 516
Molybdenum, Survey of Applications*, Jan 9 p 141
Nickel-Chromium at Elevated Temperatures, May 29 p 1597
Nickel, for Forgings, Feb 13 p 515; Mar 20 p 851
Rolled, Production and Main Channels of Consumption, 1929, Jan 9 p 145
Sheets for Aircraft*, Feb 13 p 502
Side Frames for Trucks*, Jan 16 p 226
Stainless Chromium-Manganese*, May 15 p 1468
Vanadium, for Railroad Equipment, Jan 23 p 297
Vanadium, for Railroad Springs, Feb 13 p 525
Versus Aluminum Alloys, Feb 20 p 600

Alloys:
Aluminum, for Construction of French Hydroplanes, Feb 20 p 570
Aluminum, in Automotive Field, Mar 27 p 918
Aluminum, R. R. 50, for Automobiles, May 15 p 1458
Aluminum-Silicon, Corrosion of, Jan 2 p 62
Aluminum, Structural Rolling Mill for*, Mar 6 p 707
Aluminum, Versus Steel, Feb 20 p 600
Bronze, as Made in France, Feb 13 p 545
Chrome-Nickel for Culinary Utensils*, Feb 6 p 445
Copper, P. M. G. Metal*, Mar 6 p 727
For Die Castings, Tests*, Jan 9 p 156
Heat Resisting*, Feb 6 p 431; Feb 20 p 578
Iron, Hails Promise of, June 5 p 1705
Iron, Hardening with Nitrogen, May 29 p 1608
Ironite, New Iron, Feb 27 p 664
Phos-Copper Welding Rod, June 12 p 1763

All-Steel-Equip Co.:
Tool Cabinet*, June 5 p 1693

Alpax:
Aluminum Alloy, for Construction of French Hydroplanes, Feb 20 p 570

Alumina:
Effect on Slags in Steel Melting Furnaces, Mar 20 p 845

Alumilite:
Coating of Fast Colors, Mar 20 p 868

Aluminite:
Carey Heat Insulating Material, May 8 p 1410

Aluminum:
Alloys, Versus Steel, Feb 20 p 600
Coating with Fast Colors, Mar 20 p 868
Developments in Industry, Jan 2 p 53
In Automotive Field, Mar 27 p 918
Outlook for Industry, Jan 2 p 60
Production, Exports and Imports, 1929, Mar 13 p 798
Structural Shapes of (Editorial), Mar 13 p 813

Aluminum Co. of America:
Price Discrimination Complaint Dismissed, Apr 10 p 1091
Rolling Mill for Aluminum Alloy Shapes*, Mar 6 p 707; May 1 p 1337

American Crane Co.:
Cranes of Welded Construction*, Feb 13 p 509
Large Welded Gantry Crane, Jan 16 p 265

American Electric Fusion Corporation:
Tube Welding Machine*, Apr 17 p 1161

American Electrochemical Society:
Richards Memorial Lecture Fund Started, Mar 27 p 974
Spring Meeting Proceedings, June 12 p 1752

American Engineering Council:
Administrative Board, May 8 p 1407
Officers, Jan 16 p 244

American Fork & Hoe Co.:
Safety Fork to Handle Steel Rails*, Jan 30 p 376

American Foundry Equipment Co.:
Sand Preparing Machine*, May 1 p 1310
Tum-Blast Cleaner*, May 1 p 1206

American Foundrymen's Association:
(See Foundrymen's Associations)

American Gear Manufacturers' Association:
Convention Proceedings, May 8 p 1394
Fall Meeting Announcement, June 12 p 1768

American Institute of Mining and Metallurgical Engineers:
Convention Proceedings, Feb 27 p 645

American Institute of Steel Construction:
Awards for Most Beautiful Bridges, June 19 p 1832

American Iron and Steel Institute:
Alloy Steel Production and Main Channels of Consumption, 1929, Jan 9 p 145
Board of Directors*, Jan 2 p 103
Confers with Institute of Scrap Iron and Steel, May 15 p 1481
Convention Papers, Apr 10 p 1091
Gregg, Robert, Director, May 15 p 1478
Pig Iron and Ferroalloys Production, 1929, Apr 3 p 1022
Pig Iron Capacity, 1929, May 8 p 1418
Rail Production, 1929, Apr 3 p 1048, (Editorial) p 1028
Spring Meeting Proceedings, May 15 p 1463
Steel Ingot and Castings Production, 1929, June 12 p 1764
Steel Ingot Capacity, 1929, May 8 p 1418
Steel Ingot Output by Months, December and Year, p 173; January, p 529; February, p 805; March, p 1097; April, p 1403; May, p 1771
Steel, Rolled, Production 1929, June 12 p 1794
Trackwork Shipments, December, p 249; January, p 623; February, p 880; March, p 1174; April, p 1506; May, p 1867

American Locomotive Co.:
Annual Report, May 1 p 1336

American Management Association:
Convention Proceedings, May 15 p 1478; May 22 p 1544
Discussion on Hiring Age Limit, Feb 6 p 453

American Manufacturers' Export Association:
Hurley, Edward N., President, Feb 6 p 477

American Marine Standards Committee:
To Develop Specifications for Marine Steel, Mar 13 p 806

American Monorail Co.:
Overhead Rail System*, May 1 p 1309

American Oil Burner Association:
Condemns Lavish Entertainment at Conventions, Feb 6 p 480

American Radiator & Standard Sanitary Corporation:
Cast Iron Pipe, Small Diameters for Plumbing and Heating*, May 29 p 1620
Home Modernization Campaign, June 5 p 1663

American Railway Car Institute:
Woodin, W. H., President, Jan 30 p 385

American Refractories Institute:
Officers, May 29 p 1633

American Rolling Mill Co.:
Acquires Sheffield Steel Corporation, May 22 p 1554
Foreman-Manager Plan*, Mar 13 p 777, (Editorial) p 814
Hook, Charles, R., President*, Jan 9 p 198
Motion Pictures of Continuous Sheet Rolling, May 8 p 1391
Safety Record, May 1 p 1334
To Manage British Plant, Feb 20 p 597, (Editorial) p 600

American Society for Steel Treating:
Congress to Feature Nitriding, June 19 p 1842
Group Meeting, May 29 p 1614
New Jersey Chapter Annual Meeting, Mar 20 p 866
New Haven Chapter Officers, June 12 p 1780
New York Chapter Meeting on Tungsten Carbide, May 22 p 1556
Semi-Annual Convention Proceedings, Feb 13 p 515

American Society for Testing Materials:
Committees' Spring Meeting, Proceedings, Mar 27 p 938
Considering Specifications for Alloy Steel Castings, Apr 17 p 1160
Convention Program, May 29 p 1632
Joint Committee on Steel at High Temperature, Apr 3 p 1020
Nominations, May 29 p 1619
Specifications for Welding, Jan 23 p 324
Steel Committee Meeting, Mar 6 p 728
Symposium on Automobile Materials*, Mar 27 p 930

American Society of Mechanical Engineers:
50th Anniversary, Apr 3 p 1017; Apr 10 p 1096; Apr 17 p 1171
Aeronautical Meeting with Engineers' Society of Western Pennsylvania, Mar 20 p 858
Joint Committee on Steel at High Temperature, Apr 3 p 1020
Machine Shop Practice Program, May 29 p 1628
Management Engineering Problems, Mar 13 p 781
Management Meeting, Mar 13 pp 781, 786
Materials Handling in Chicago Daily News Plant, Mar 13 p 795
Materials Handling Meeting, Mar 13 pp 781, 794, 795
Micromotion Study, Apr 24 p 1240
Nominations, June 19 p 1840
Readjustments of the Machine Age, Mar 13 p 794
Semi-Annual Meeting, June 19 p 1840
Shop Practice Division: Welding and Cutting of Steel, Jan 16 p 245; Mechanical Lapping, Mar 27 p 943
Wage Incentives in Manufacturing, Mar 13 p 786
Wire Rope Discussions Published, Jan 9 p 172

American Society of Safety Engineers:
Industrial Safety Work Fails to Interest, Mar 13 p 806

American Standards Association:
Financing, Jan 30 p 387

American Steel and Heavy Hardware Association:
Convention Proceedings, May 29 p 1629

American Steel & Wire Co.:
Expansion, Apr 10 p 1101; Apr 17 p 1198

American Tin Trade Association:
Officers, Mar 13 p 836

American Welding Society:
Annual Meeting, May 1 p 1320

American Zinc Institute:
Annual Meeting, Apr 24 p 1236

Anderson, Harvey A.:
Die Casting Industry*, Progress, Jan 9 p 155

Anderson, Robert, J.:
Outlook for Aluminum Industry, Jan 2 p 60

Annealing:
(See Also Heat Treating)
Bright, Grünewald Process*, Apr 3 p 1002

Apprentices:
Training—a Growing Need, June 5 p 1680
Training Foundry*, Jan 16 p 215
Training in Pratt & Whitney Plant*, Apr 24 p 1209

Arcade Mfg. Co.:
Jolt Squeezer*, May 1 p 1305

Arrow Aircraft & Motors Corporation:
Service Piping for Welding Gases* Feb 20 p 575

Ashdown, H. H.:
Snow Flakes in Alloy Steel Forgings*, May 8 p 1380

Associated Alloy Steel Co.:
Branch Offices, Mar 13 p 836
Organized to Sell Nitralloy and Rustless Steel, Feb 13 p 555

Associated Machine Tool Dealers:
Spring Convention, June 12 p 1775

Association of Iron and Steel Electrical Engineers:
Convention Proceedings, June 26 p 1902
Symposium on Open-Hearth Furnace Control, June 26 p 1889

Assouan Dam:
Chrome Nickel Plates Used at, Mar 20 p 867

Atlanta:
Advertising a City (Editorial), Apr 3 p 1027

Austin Co.:
Welded Structural Frame Joints*, Jan 16 p 222

Austin, W. J.:
Prospects for American Business in Russia*, Feb 27 p 652

Australia:
Emergency Tariff, Apr 10 p 1087
Iron and Steel Output, 1929, Apr 10 p 1126

Automatic Transportation Co.:
Tiering-Lifting Truck*, May 1 p 1307

Automobiles:
All-Aluminum, Mar 27 p 918
Aluminum Alloys for, May 15 p 1458
As a Trade Index (Editorial), Jan 23 p 323
Body Building in Murray Plant*, Feb 6 p 427
Ford World Output, 1929, Jan 16 p 283
Frame Manufacture in Smith Plant*, June 5 p 1665
Materials, Symposium on*, Mar 27 p 930
Outlook for Industry, Jan 2 p 16; May 8 p 1390
Parking Space for Alamo Iron Works Employees*, June 19 p 1831
Production, 1929*, p 19; December, p 349; January, p 694; February, p 902; March, p 1237; April, p 1581; May, p 1942
Production Consistent (Editorial), June 26 p 1916
Production, Variations in (Editorial), Feb 6 p 458
Progress in Tests of Materials for, May 1 p 1334
Registration, World, Mar 6 p 768
Stabilizing Output (Editorial), Jan 9 p 170

Aviation:
In Readjustment Era, Jan 2 p 22

B

Babcock & Wilcox Co.:
Gas-Fired Laboratory Furnace*, Feb 6 p 448

Bablik, Dr. Ing. Heinz:
Bending Conditions of Galvanizing*, May 15 p 1452; May 22 p 1528
Baily, T. F.:
Gray Iron from Steel Scrap, Mar 6 p 725
Bain, E. C.:
Martensite and Its Structure, Feb 13 p 516
Baird Machine Co.:
Chucking Machine to Operate on Pistons*, Apr 17 p 1162
Baker, L. R.:
Subdivision of Metric Units, Apr 3 p 1028
Baldwin Locomotive Works:
Drop Forgings, Large and Unusual*, Apr 3 p 1005
Frame and Cylinder Machine Shops*, Mar 27 p 921
Handling Heavy Materials*, May 22 p 1517
Welding Practices in Tank Shop*, Mar 6 p 715
Baldwin Tool Works:
Gas Furnaces for Lead Hardening of Shovels*, June 26 p 1880
Ballay, Dr. Marcel:
Corrosion of Cast Iron, Feb 13 p 532
Bandsaws:
Carter Quick-Change Tire and Wheel for*, Apr 3 p 1014
Barges:
Steel Consumption, 1929, Jan 16 p 243
Barnes Corporation, John A.:
Automatic Lathe with Hydraulic Feed*, May 1 p 1327
Barnes Drill Co.:
Cylinder Honing Machine*, Jan 30 p 381
Drilling Machine, Front Axle*, June 19 p 1839
Barnes, W. C.:
Detecting Rail Fissures, May 29 p 1610
Bars:
Sea Water Corrosion Test, May 1 p 1293
Batteries:
Electric Storage for Trucks*, May 8 p 1392
Batty, George:
Sand, Most Potent Variable, May 22 p 1523
Bauer Brothers Co.:
Grinding Machine Parts of Welded Steel*, June 19 p 1819
Bausch & Lomb Optical Co.:
Optical Bevel Protractor*, Apr 24 p 1232
Beardsley & Piper Co.:
Electric Magnetic Separator*, May 1 p 1308
Bearings:
Anti-Friction, Requirements for Mills and Motors, June 26 p 1897
Ball, Fafnir Small Sealed, Mar 13 p 802
Ball, Manufacture by S K F Industries, Inc.*, Mar 6 p 703
Johnson Bronze Self-Lubricating, Feb 20 p 593
Becket, Frederick M.:
Rustless Chromium - Manganese Steels*, May 15 p 1468
Bellevue Industrial Furnace Co.:
Electric Soldering Iron Heater*, Mar 20 p 869
Bending:
Qualities in Galvanizing Coating*, May 15 p 1452; May 22 p 1528
Bending Machine:
Thomas Straightening and*, Feb 27 p 663
Bendix-Westinghouse Automotive Air Brake Co:
Organized, Mar 6 p 728
Bennington, E. T.:
Spring Suspension and Long Wheelbase for Overhead Carriers, Feb. 20 p 574
Benson, A. D.:
Welded Girders Fabricated by Machine*, May 8 p 1382
Beryllium:
New Metal for Aircraft, Feb 27 p 692
Bethlehem Steel Corporation:
Acquires Danville Structural Steel Co., Feb 6 p 466
Annual Meeting, Apr 10 p 1134
Annual Report, Jan 30 p 386; Mar 20 p 875; Quarterly Report, May 1 p 1332
Merger with Youngstown Sheet & Tube Co.*, Mar 20 pp 876, 897, (Editorial) p 882; Mar 27 p 948; Apr 3 p 1023; Ratified, Apr 17, p 1165; Suit to Block, May 1 p 1333; May 8 p 1429
Organizes Pacific Coast Steel Corporation, Jan 30 p 384
Stock Taken by Employees, Apr 24 p 1237
Bidding:
Firm, Resolutions Adopted by Machinery Builders Society, May 22 p 1552
Billet Gouger:
Putnam*, Mar 27 p 944
Bins:
Simplex Nesting*, June 26 p 1907
Black & Decker Co.:
Heating Small Parts Electrically*, Apr 24 p 1214
Blakelock, R. M.:
Micromotion Study Applied to Manufacture of Small Parts, Apr 24 p 1240
Blinkenberg:
Asserts New French Alloy Steels Are of German Origin, June 19 p 1848
Bliss Co., E. W.:
Double Crank Press*, May 29 p 1623
Double Eccentric Press*, Apr 3 p 1013
Shear-Type Scrap Cutter*, Mar 13 p 800
Blisters:
Causes on Enameled Iron, May 15 p 1451
Blower:
Wilbraham-Green Cupola*, May 1 p 1311
Blowpipe:
Brassert Insulated for Blast Furnaces*, Apr 10 p 1086
Oxweld General Purpose*, Mar 13 p 802
Blue Valley Machine & Die Works:
Flanging Machine with Roller Bearings*, Jan 16 p 238
Boegehold, A. L.:
Cast Iron for Automobiles, Mar 27 p 930
Boilers:
Power, Welded Drums for, May 1 p 1320 (Editorial) p 1339
Booher, John R.:
Washing Windows to Reduce Costs*, May 8 p 1369
Book Reviews:
Aluminum Industry, June 19 p 1828
Arc Welding, May 8 p 1384
Chemical Dictionary, Jan 30 p 413
Commercial Survey of New England, June 18 p 1829
Davenport, Thomas, Pioneer Inventor, Jan 30 p 372
Engineering Drawings, Jan 30 p 413
Five-Day Week in Manufacturing Industries, May 8 p 1434
Forty Years with General Electric, Jan 30 p 371
Foundry Accounting, as Done in Germany, Jan 30 p 413
Gages and Fine Measurements, May 8 p 1383
Gmelin's Handbuch der anorganischen Chemie, Jan 30 p 413
Hand-to-Mouth Buying, May 8 p 1383
High-Strength Iron Castings, Jan 30 p 372
Impurities in Metals, Feb 27 p 691
Industrial Heat Transfer, Feb 27 p 691
Iron and Steel, Short Manual (Kurzgefasste Eisenhuttenkunde), Feb 27 p 691
Lathe Construction and Operation, Jan 30 p 371
Market Data Handbook of United States, Jan 30 p 413
Materials-Handling Equipment, June 19 p 1828
Modern Aviation Engines, Feb 27 p 656
Practical Steel Making, Jan 30 p 371
Psychology and Industrial Efficiency, Feb 27 p 691
Tin Mining, Production, Technology and Applications, May 8 p 1384
Books Received: Jan 30 p 414; Feb 27 p 692; May 8 p 1434; June 19 p 1829
Bopp Steel Corporation:
Starts Cold Strip Mill, Apr 10 p 1092
Borg-Warner Corporation:
Buys Plant to Make Special Steel, Feb 27 p 665
Boring Machines:
Consolidated Drilling, Milling and*, Feb 20 p 593
Botfield Refractories Co.:
Chromite Cement, Jan 16 p 245
Bowers, Glenn A.:
Problem of Unemployment, Jan 2 p 65
Boyd, T. A.:
Research Creates Employment, Feb 20 p 595
Boyer, Charles S.:
Dover Forge Iron Tools and Tongs of the 1860's*, Feb 13 p 525
Box Crane & Hoist Corporation:
Plant Rearrangement Adds to Capacity*, Apr 17 p 1156
Bradley Car Co., Osgood:
Merged with Pullman, Inc., and Standard Steel Car Co., Jan 2 p 108
Brake:
Cincinnati Press, Unusual Length*, June 12 p 1763
Brandt, E. C.:
Economies Through Standardization, May 8 p 1388
Brass:
Deep-Etch Test, June 12 p 1745
Electric Furnace for Melting, June 12 p 1747
Season Cracking Due to Stress and Corrosion*, Mar 27 p 932
Brassert & Co., H. A.:
Insulated Blowpipe for Blast Furnaces*, Apr 10 p 1086
Brazil:
Demand for Road Machinery, Feb 13 p 552
Breisky, J. V.:
Electric Eye for Determining Temperature or Illumination*, Apr 24 p 1231
Bridgeport Safety Emery Wheel Co.:
Buffing Lathe*, June 5 p 1694

Bridges:
Hudson River, Clamping Wires into Cables*, May 29 p 1604
Manufacture of Wire for*, Apr 17 p 1147
Mount Pleasant and Mount Hope Receive Awards for Most Beautiful, June 19 p 1832

British Empire Steel Corporation:
To Be Reorganized, Apr 17 p 1170

Broadcasting:
Business Editors Talk Over Radio*, Apr 10 p 1079

Bromer, H. E.:
Duplexing Iron Castings with Electric Furnace*, May 8 p 1372

Bronze:
What Is a? Jan 16 p 236

Brown & Sharpe Mfg. Co.:
Car Wheel Gages*, June 5 p 1694
Combination Depth and Drill Point Gage*, Feb 13 p 521
Depth Gage Attachment*, Feb 27 p 663
Micrometer, No. 24*, Feb 13 p 521
Redesigned Plain Milling Machine*, Feb 6 p 451
Screw Gage*, May 1 p 1331
Wire Gage Selectors*, Feb 20 p 593

Brown-Boveri & Co.:
Turbo Blowers with Chromium-Nickel Blades, Feb 27 p 636

Bruere, Henry:
Individual Is Key to Prosperity, Jan. 2 p 79

Bryant, Leslie E.:
Basic Conditions of Effective Utilization of Materials, May 8 p 1388

Buchler, Walter:
China's Future Steel Needs*, Apr 10 p 1073
Foreign Machinery Needs of Japan*, June 12 p 1738

Buckeye Portable Tool Co.:
Grinder with Low Air Consumption*, May 1 p 1305

Buckingham, Earle:
Inspection Costs in Various Plants, Feb 20 p 577

Budd Mfg. Co., Edward G.:
Airplane Parts of Stainless Steel, Apr 10 p 1088

Budgets:
System in Zimmerman Steel Foundry, May 22 p 1538

Buffalo Forge Co.:
Heavy-Duty Billet Shear*, May 22 p 1547

Buffing Machine:
Bridgeport, for Large Pieces*, June 5 p 1694

Building:
(See also Construction)
An Anomalous Situation (Editorial), Jan 30 p 388
Campaign to Speed Up (Editorial), Feb 6 p 456
Contracts, December, p 274; January, p 623; February, March, p 1174; First Quarter, p 1238; April, p 1500; May, p 1840
High Cost of (Editorial), Feb 27 p 666
Home (Editorial), Apr 17 p 1179
Industrial, 1929*, Jan 2 p 18
Outlook for 1930, Jan 2 p 12; Jan 9 p 146*; Feb 6 p 477
Residential, Room for (Editorial), June 26 p 1914

Bull, R. A.:
Progress in Steel Castings*, Jan 2 p 43

Bullard Co.:
Electrochemical Cleaning Process*, Mar 27 p 947

Bullock, Charles J.:
End of Business Recession in Sight, Jan 30 p 385

Bullock, William E.:
Metric System, Feb 20 p 595; Mar 6 p 743

Bumpers:
Manufacture in Eaton Plant*, Apr 24 p 1217

Bureau of Standards:
Maizolith, New Industrial Material, May 15 p 1501
To Have New Hydraulic Laboratory, Apr 17 p 1181

Burners:
Oxweld Laboratory, Mar 6 p 735

Bus Transportation:
Growing Industry, Jan 2 p 15

Business:
Betterment, Why Minimize Signs of? (Editorial), Jan 23 p 322
Big and Lesser (Editorial), May 15 p 1482
Car Loadings Show No Trade Gain (Editorial), May 29, p 1630
Chart of Plan to Stabilize*, Mar 13 p 810
Depression, Initiative in (Editorial), Apr 3 p 1026
Editors Talk Over Radio*, Apr 10 p 1079
Forecast*, Jan 2 p 69; June 12 p 1767
Forecast, Value of, June 12 p 1744
Favorable Factors Indicate Early Revival in, June 19 p 1833
Gets Back to Sound Basis, May 15 p 1447
Indications Not Conclusive, Apr 17 p 1159
Is There Now a Long Swing in? (Editorial), May 29 p 1630
Maladjustment Temporary, Mar 20 p 865
Reactions Natural, Apr 24 p 1229
Reactions Not Yet Completed*, Feb 27 p 648
Recession Approximates 1924, June 5 p 1699
Recession, Bottom Reached, May 22 p 1553
Recession, End in Sight, Jan 30 p 385
Recovery and Price Slashes (Editorial), Jan 9 p 168
Seeking Good and Bad Spots in (Editorial), Mar 13 p 812
Trade Nearly Normal (Editorial), Feb 27 p 666

Butane:
New Fuel for Industrial Heating, May 15 p 1478

Buying:
Advantages of Uniform Methods, Feb 6 p 452

Buying and Selling:
Reciprocity in (Editorial), Mar 20 p 883

Byers Co., A. M.:
Old and New in Wrought Iron*, June 26 p 1898

By-Products:
Production, 1929, June 19 p 1870

C

Cabinets:
All-Steel-Equip Tool*, June 5 p 1693

Cable:
Manufacture in Western Electric Plant*, May 29 p 1611
Wire, Stretching Beyond Working Load*, June 12 p 1748

Caldwell, Frank W.:
Steel Airplane Propellers, Mar 20 p 860

Camden Forge Co.:
Nitriding Large Forgings*, Mar 13 p 787

Canada:
Automobile Production, January, p 694; February, March, p 1237; April, p 1581, 1701; May, p 1942
Capacities of Steel Foundries, Jan 2 p 59
Machinery, Castings and Forgings Production, 1928, Jan 23 p 348
Metal Production, 1929, Jan 16 p 269
Ontario Metal Industries Research Association Organized, Jan 16 p 249
Pig Iron and Steel Production, November, p 105; December, p 476; January, p 768; February, p 1200; March, p 1361; April, p 1558
Steel Company Expansion, Jan 2 p 94
Tariff Revision, May 8 pp 1404, 1411; June 12 p 1797

Canadian Steel Corporation, Ltd.:
Expansion Plans, May 8 p 1428

Cap Screws:
Prices Revised, Feb 6 p 476

Capacity:
Coke, By-Product, Jan 9 p 199
Pig Iron, Ferroalloys and Steel Ingots, 1929, May 8 p 1418
Republic Steel Corporation, Apr 10 p 1119
Rolling Mills for Copper Rods*, Apr 24 p 1221
Steel Foundries of United States and Canada, Jan 2 p 59
Steel, Four Years (Editorial), May 15 p 1483; 10 Years*, May 1 p 1329; 1929, May 8 p 1418
Steel, Increasing (Editorial), Jan 16 p 250
Steel-Making Records, Jan 2 p 97

Capital:
Supplies of (Editorial), Feb 13 p 530

Car Loadings:
Show No Trade Gain (Editorial), May 29 p 1630

Carborundum Co.:
Compound for Lapping Tungsten Carbide*, May 15 p 1477

Carey Mfg. Co., Philip:
High Temperature Heat-Insulating Material, May 8 p 1410

Carlin, J. E.:
Making Duplex Steel, Mar 27 p 925

Carlyle Johnson Machine Co.:
Clutch with Chrome-Nickel Steel Fingers*, Mar 20 p 869

Carnegie Steel Co.:
Pension Disbursements, Feb 6 p 477
Safety Trophy for 1930*, Jan 9 p 150

Carrier Engineering Corporation:
Air Conditioning System in Columbus Office Building*, June 26 p 1893
Vapor Baths for Degreasing Metals, Jan 16 p 240

Cars:
Freight, in Service 1926-1929 (Editorial), June 19 p 1847

Carter, J. L.:
Gray Iron Cost System, May 22 p 1535

Carter Products Co.:
Quick-Change Bandsaw Tire and Wheel*, Apr 3 p 1014
Casting, Centrifugal:
Alloy Steel Guns, May 22 p 1521
Castings:
Cleaning with Water Jet, Feb 27 p 692
Gas Furnaces for Annealing*, Feb 27 p 637; Mar 27 p 952
Heat and Corrosion Resistant*, May 1 p 1277
Small, Spacing in Group Patterns*, Jan 23 p 293
X-Raying*, May 1 p 1290
Castings, Alloy Steel:
Heat Treating — Three Methods, June 19 p 1821
Specifications Considered, Apr 17 p 1160
Status of, May 1 p 1294
Castings, Aluminum:
Advances in, May 29 p 1598
Castings, Iron:
British Research on, Mar 6 p 714
Compared with Welded Steel*, Mar 20 p 861
Correlation of Tests for, June 5 p 1679
Duplexed with Electric Furnace and Cupola*, May 8 p 1372
Economic Field of, May 15 p 1484
Electric Furnace for Corrosion Resistance, Feb 13 p 532
For Automobiles, Mar 27 p 930
French Foundry Uses Rotating Furnace for Melting, June 19 p 1817
From Steel Scrap, Mar 6 p 725
Molybdenum in, Jan 16 p 252
Of High Tensile Strength, May 22 p 1562
Pearlitic Made Commercially, Apr 10 p 1086
Production and Other Statistics, January, p 770; February, p 1019; March, p 1356; April, p 1662
Properties for Engineering Material, May 1 p 1281; May 15 p 1484
Properties of, and Coke, June 5 p 1680
Refuse to Step Aside, May 1 p 1281; May 15 p 1484; May 29 p 1632; June 5 p 1704; June 19 p 1848
Segments for East River Tunnel, May 29 p 1643
Standard Cost System Recommended, May 22 p 1535
Trend, Jan 3 p 36
With Nickel, Copper and Chromium, Apr 24 p 1216
Castings, Malleable:
Diversified Specifications Needed*, June 19 p 1825
Foundry Practice, May 22 p 1532
Machinability of, May 22 p 1532
Production at Columbia Plant*, May 1 p 1285
Production by Months, November, p 187; December, p 349; January, p 613; February, p 893; March, p 1509; April, p 1790; May, p 1942
Progress in, May 1 p 1297
Castings, Monel Metal:
Foundry Practice, June 12 p 1754
Castings, Nickel:
Foundry Practice, June 12 p 1754
Castings, Steel:
240-Ton Anvil Base*, May 8 p 1407
Best Conditions for Pouring, Mar 20 p 920
Cleaning, in General Electric Plant*, Mar 6 p 730
Cutting by Oxygen Lance*, Apr 24 p 1230
Green Sand Molds for*, Mar 6 p 711
Manufacture in Eastern Plant*, Mar 20 p 853
Preventing Pin Holes in, June 26 p 1896
Production, November, p 187; December, p 486; January, p 613; February, p 977; March p 1509; Year 1929, p 1764; April, p 1790; May, p 1942
Progress in, Jan 2 p 43
Rustless, Manufacture in Ohio Foundry*, Apr 3 p 993
X-Raying Large*, Feb 13 p 499
Caswell & Starke, Inc.:
Edward W. Starke Retires from, May 15 p 1479
Cement:
Chromite, Jan 16 p 245
Cement, Portland:
Production by Months, January, p 695; February, p 879; March, p 1174
Ratio to Structural Steel, 1913-1929, (Editorial), Feb 13 p 530
Census:
New Schedule for Machine Tool Industry, Feb 13 p 522
Taking (Editorial), Apr 24 p 1245
Census of Distribution:
Canvassing Begun, Jan 23 p 321; Jan 30 p 383
Questions Answered Regarding, Feb 20 p 587
Census of Manufactures:
Changes in Iron and Steel Manufacture, May 15 p 1505
Questions Answered Regarding, Feb 20 p 587
Center:
Ready Ball-Bearing Tailstock*, Jan 9 p 161
Central Alloy Steel Corporation:
Annual Report, Apr 10 p 1133
Central Railroad of New Jersey:
Acquires Wharton & Northern and Mount Hope Mineral Railroads, Feb 20 p 620
Centrifugal Casting:
Alloy Steel Guns, May 22 p 1521
Century Electric Co.:
Fan-Cooled Induction Motors*, Mar 20 p 869
Chain:
Cast Steel Anchor in 90-ft. Lengths*, Feb 6 p 434
Link-Belt Steel Drive, Apr 10 p 1086
Steel, Tests of Hand Welded, June 19 p 1809
Chain Belt Co.:
Leak-Proof Conveyor*, May 15 p 1474
Scrap Handling Equipment*, Mar 13 p 796
Chamber of Commerce of the United States:
Annual Meeting, May 8 p 1401
Chambersburg Engineering Co.:
Production Control in Building Large Machines*, Apr 3 p 997
Champion Machine & Forging Co.:
Controlling Fiber in Forgings*, May 22 p 1522
Chandler Products Corporation:
Formed to Make Cap Screws, Feb 13 p 550
Chapple, Bennett:
Industrial Marketing in New Era, May 29 p 1629
Charging Machine:
Gibbons-Van Marle for 60-Ft. Plates*, June 26 p 1884
Chemistry of Steel*, May 22 p 1536
Chesapeake & Ohio Railroad:
New Ore Dock, June 19 p 1840
Chicago World's Fair:
To Show Progress in Iron and Steel, Jan 30 p 390
China:
Future Steel Needs*, Apr 10 p 1073
Ching, Cyrus:
Mechanization and the Worker, Mar 13 p 794
Chromium:
Gains in Consumption, Feb 6 p 474
Chucking Machine:
Baird, to Operate on Pistons*, Apr 17 p 1162
Cincinnati Bickford Tool Co.:
3-Ft. Radial Drill*, June 5 p 1693
Master Radial Drilling Machine*, May 1 p 1326
Cincinnati Electrical Tool Co.:
Metallographic Polishing Machine*, Jan 9 p 159
Cincinnati Planer Co.:
Billet Cleaning Machine*, Jan 30 p 367
Grinder Head*, Jan 23 p 317
Planer-Type Milling Machines*, Jan 30 p 378
Cincinnati Shaper Co.:
Press Brake, Unusual Length*, June 12 p 1763
Clark Tructractor Co.:
Lifting and Tilting Truck*, May 1 p 1301
Clark, W. C.:
Building Industry, Outlook, Jan 2 p 12
Clarke, Charles W. E.:
Economies Through Use of Waste Heat*, June 5 p 1681
Cleaning Machine:
For Billet Surface*, Jan 30 p 367
Cleaning Process:
Bullard-Dunn Electrochemical*, Mar 27 p 947
Clearfield Machine Co.:
Sand Mixer*, May 1 p 1302
Cleveland-Cliffs Iron Co.:
Acquires Corrigan-McKinney Steel Co.*, Mar 27 p 940
Annual Report, Apr 10 p 1092
Merged with Oglebay, Norton & Co., June 5 p 1697
Cleveland Crane & Engineering Co.:
Welding Structural Girders*, May 8 p 1382
Cleveland Electric Motor Co.:
Semi-Inclosed Motors*, Apr 10 p 1085
Cleveland Electric Tramrail:
Overhead Pouring Device*, May 1 p 1306
Swing Crane Grinder*, Feb 13 p 552
Window Washing Equipment*, May 8 p 1369
Cleveland Hardware Co.:
Conveyors in Trimming Department*, May 29 p 1607
Cleveland Pneumatic Tool Co.:
Sand Rammer*, June 26 p 1906
Clutch:
Carlyle Johnson with Chrome-Nickel Steel Fingers*, Mar 20 p 869
Washburn Shops Automatic Starter or*, Apr 10 p 1084

Coal:
And Power, World's (Editorial), May 1 p 1340
Consumption of Coking, 1929, Apr 17 p 1170; March, May 1 p 1334
Industrial Stocks, Jan 9 p 206; Feb 27 p 695; Mar 20 p 870; Apr 10 p 1123; June 12 p 1789
Inert Materials and Coking Power, Feb 13 p 498
Production, December, p 283; January, pp 526, 695; February, p 880; March, p 1080; April, May, p 1868
Washing, Influence on Coke Properties, June 26 p 1886

Coatings:
Electrolytic Deposit with Fast Colors, Mar 20 p 868
Electroplate, Protective Value of Some, June 5 p 1680
Galvanizing, Bending Qualities*, May 15 p 1452; May 22 p 1528
Germanium for Steel, June 12 p 1752
Metallic Liquid for Protecting Galvanizing, Apr 10 p 1088
Paint, and Strength of Riveted Joints, Mar 27 p 917

Code:
For Employment of Engineering Graduates, Apr 10 p 1078

Coes, Harold V.:
Eliminating Industrial Wastes, Jan 2 p 67
Materials Handling, May 15 p 1501

Coke:
By-Product and Beehive Production, November, p 274; December, pp 283, 473; January, pp 526, 665; February, pp 880, 977; March, pp 1080, 1404; April, May, p 1868
By-Product Activity, 1929, Feb 27 p 665
By-Product Capacity, Jan 9 p 199
Properties, Influence of Washing Coal on, June 26 p 1886
Properties of Cast Iron and, June 5 p 1680

Coler, Carl S.:
Training Future Business Leaders*, June 12 p 1741

Colorado Fuel & Iron Co.:
Annual Report, Apr 10 p 1134

Columbia Malleable Castings Corporation:
New Plant*, May 1 p 1285

Columbia Steel Co.:
Formed as Steel Corporation Subsidiary, June 26 p 1932

Columbia University:
To Build Testing Laboratory, Jan 30 p 381

Columbian Steel Tank Co.:
Recessed Nut to Stop Leakage*, May 1 p 1331

Columbus Bolt Works:
Noise Deadening and Air Conditioning Office Building, June 26 p 1893

Compressors:
Air, Gardner-Denver Synchronous Motor-Driven, Feb 27 p 662

Concrete Reinforcing Steel Institute:
Convention Proceedings, Apr 10 p 1088

Conradson Tool Corporation:
Expansion Reamer*, Jan 9 p 160

Consolidated Machine Tool Corporation:
Applies Hydraulic Feed to Car Wheel Borer*, May 22 p 1548
Betts Horizontal Boring, Drilling and Milling Machine*, Feb 20 p 593

Construction:
(See Also Building)
Engineering, Large, May 22 p 1545
Highway, First Quarter, May 15 p 1500; June 19 p 1868
Home Modernization—Way Out for Industry, June 5 p 1663
Public, Estimates for 1930, Jan 23 p 321
Public Works and Utilities Contracts, May 29 p 1626; June 19 p 1868; June 26 p 1932
Public Works Program, Mar 6 p 736; Mar 13 p 809; Mar 20 pp 878, 897; Apr 3 p 1020
Steel Company, 1929, Jan 2 p 97

Continental Roll & Steel Foundries, Inc.:
Merger of Duquesne, Wheeling and Hubbard Foundry Companies, May 22 p 1581
Officers, June 26 p 1912

Continental Shares, Inc.:
Largest Holder of Independent Steel Company Stocks, Jan 9 p 172

Control:
Stephen-Adamson for Speed Changers*, Feb 13 p 520

Conventions:
American Electrochemical Society, June 12 p 1752
American Foundrymen's Association,* May 15 p 1478; May 22 p 1538
American Gear Manufacturers' Association, May 8 p 1394
American Institute of Mining and Metallurgical Engineers, Feb 27 p 645
American Iron and Steel Institute, May 15 p 1463
American Management Association, May 15 p 1478; May 22 p 1544
American Society for Steel Treating, Feb 13 p 515
American Society for Testing Materials, Committees, Mar 27 p 938
American Steel and Heavy Hardware Association, May 29 p 1629
American Welding Society, May 1 p 1320
Associated Machine Tool Dealers, June 12 p 1775
Association of Iron and Steel Electrical Engineers, June 26 p 1902
Chamber of Commerce of the United States, May 8 p 1401
Concrete Reinforcing Steel Institute, Apr 10 p 1088
Engineering Congress, World,* Jan 16 p 223; Jan 23 p 298
Entertainment Abuses, Feb 6 p 480; (Editorial), Feb 20 p 598
Institute of Metals (British), Mar 27 p 949
Institute of Scrap Iron and Steel, Mar 6 p 757; Mar 13 p 797
Iron, Steel and Allied Industries of California, Feb 27 p 649
National Association of Flat Rolled Steel Manufacturers, June 26 p 1899
National Association of Purchasing Agents, June 26 p 1909
National Hardware Association, May 22 p 1557
National Machine Tool Builders' Association, May 29 p 1617
National Metal Trades Association, Apr 24 p 1228
Non-Ferrous Ingot Metal Institute, May 8 p 1396
Open-Hearth Operators, May 29 p 1601; June 5 p 1669; June 12 p 1758
Taylor Society, May 8 p 1388

Conveyors:
(See Also Materials Handling)
Aid Production in Dayton Pump & Mfg. Plant*, Jan 23 p 300
Chain-Belt Leak-Proof*, May 15 p 1474
For Core Ovens in Palmer-Bee Plant*, June 5 p 1673
In Kenosha Foundry*, Apr 17 p 1138
In Trimming Department of Cleveland Hardware Co.*, May 29 p 1607
Link-Belt Mold, with Vibrating Screens*, May 8 p 1392
Making Refrigerators on*, Mar 27 p 928
Overhead, Spring Suspension and Long Wheelbase for, Feb 20 p 574
Palmer-Bee Suspended*, May 1 p 1299
Scrap Handling in Motor Wheel Plant*, Feb 27 p 631
Shepard Niles for Hot Metal*, May 1 p 1310
System in Dura Plant*, Apr 10 p 1061
System in Eastern Jobbing Foundry*, Mar 20 p 853

Copper:
Consumption by Printing Trades, May 8 p 1371
Ingots, Gas Content and Soundness, Mar 27 p 949
Outlook, Jan 2 p 92
Prices—Too Much Stability (Editorial), Apr 24 p 1245
Production, Exports and Imports, 1929, Feb 13 p 558

Copper and Brass Research Association:
Copper's Service to Industry, Jan 9 p 170

Copper Rods:
Rolling Mill Capacity*, Apr 24 p 1221

Copper Wire:
Defects in*, Mar 13 p 792

Coppus Engineering Corporation:
Aeroplane Heat Killer*, Apr 24 p 1231

Core Ovens:
Conveyors for, in Palmer-Bee Plant*, June 5 p 1673

Corrigan-McKinney Steel Co.:
Acquired by Cleveland-Cliffs Iron Co., Mar 27 p 940

Corrosion:
Alloys at High Temperature, Feb 6 p 431; Feb 20 p 578
Aluminum-Silicon Alloys, Jan 2 p 62
Brass Pickling Tanks to Resist, Mar 27 p 917
Cast Iron, Feb 13 p 532
Chromium Steel, Five-Year Test, May 15 p 1454
Copper Bearing Steels, Apr 3 p 1028
Electro-Deposited Coatings, Protective Value of Some, June 5 p 1680
Nitrided Steels, May 22 p 1531
Open Valley Flashings, Prevention, Jan 23 p 302
Plates and Rivets Peculiar Case of, Mar 6 p 713
Reproducibility in, June 12 p 1754
Sea Water, of Test Bars, May 1 p 1293
Season Cracking of Brass Due to Stress and*, Mar 27 p 932
Theory and Practice of Resistant Equipment, Jan 23 p 306
White Rust of Galvanized Wares, May 29 p 1610

Corse, W. M.:
Advances in Non-Ferrous Metals, Jan 2 p 55
Developments in Bearing Metals, Mar 6 p 722

Costs:
Inspection, in Various Types of Plants, Feb 20 p 577
Lowered by Budget System, May 22 p 1538
Machine Tool Builders Discuss Methods, May 1 p 1322

(Costs, *Continued*)
Uniform Methods, Discussed by Ohio Foundrymen, June 26 p 1883
Uniform Methods, Discussed by Steel Founders, Feb 13 p 522
Novelties at Less Than (Editorial), Feb 13 p 530
Standard System for Cast Iron, May 22 p 1535
Unit, Reduced by Planning, June 12 p 1768
Workman Needs Data More Than Key Men, June 26 p 1879

Coulter, R. S.:
Fair Comparisons of Performance Records, Mar 27 p 952

Countersinking Machine:
Kent Double, for Nuts*, June 26 p 1905

Cox, John L.:
Steel for Turbine Blades and Gas Engine Valves, May 29 p 1600

Crampton, D. K.:
Season Cracking of Brass*, Mar 27 p 932

Crane, E. V.:
Progress in Pressed Metal Industry*, Jan 2 p 40

Cranes:
Aluminum Alloy*, June 5 p 1689
American Large Welded Gantry, Jan 16 p 265
Of Welded Construction*, Feb 13 p 509
Overhead, Safety Signals for, Jan 23 p 317
Production in Box Crane & Hoist Plant*, Apr 17 p 1156
Universal, to Expedite Building and Demolition*, June 5 p 1694

Crawford, George G.:
President Jones & Laughlin Steel Corporation, Jan 30 p 412

Crockett, C. B.:
Combining Different Types of Materials Handling Equipment*, June 19 p 1810

Crossing:
Ryerson All-Steel Highway*, May 8 p 1398

Cunningham-Hall Aircraft Corporation:
Airplanes with Metal Rib Wings*, Jan 16 p 230

Cushing, W. C.:
Rail Breakages and Experiments with Heat Treated Rails, Apr 24 p 1224

Cut-Off Machine:
Da Sanno Radiac*, Apr 3 p 1012

Cutler's Company:
Maintaining Name "Sheffield," Jan 16 p 269

Cutter:
Bliss Shear-Type Scrap*, Mar 13 p 800
Landis Grooving for Victaulic Joints*, May 29 p 1624

D

Danville Structural Steel Co.:
Acquired by Bethlehem Steel Corporation, Feb 6 p 466

D'Arcambal, A. H.:
Tool Steel Failures, Feb 20 p 583; Mar 6 p 743

Davenport Machine Tool Co.:
Redesigned Screw Machine*, June 12 p 1762

Davies & Thomas Co.:
Manufacture of Pearlitic Cast Iron, Apr 10 p 1086

Davies, L.:
Protective Value of Some Electro-Deposited Coatings, June 5 p 1680

Dayton Forging & Heat Treating Co.:
Heat Treating Plant*, May 15 p 1449

Dayton Pump & Mfg. Co.:
Conveyor System*, Jan 23 p 300

Decherf, E.:
Proper Temperature for Forging, May 15 p 1485

Defiance Machine Works:
Cylinder Head Drilling Machine*, Jan 30 p 378

De Forest, A. T.:
Plea for Fair Policy in Selling Practices, Feb 27 p 651

Degreasing Metals:
Carrier Vapor Bath Process, Jan 16 p 240

Deister Concentrator Co.:
Foundry Screen with Vibrator*, May 1 p 1301

Delaware & Hudson Railroad:
Elastic Work Day, Apr 24 p 1237

Delaware, Lackawanna & Western Railroad:
H-Beams to Carry Power Wire, June 26 p 1892

Denison, A. C.:
Evils in Using Cost Figures, June 26 p 1883

Densite:
Refining Material for Cleaner Steel*, June 26 p 1895

Deoxidation:
In Steel Making, Apr 24 p 1223

Department of Commerce:
New Building*, Apr 24 p 1225

Depreciation:
Machinery, Washington Conference on, Feb 6 p 455

De Sanno & Son, A. P.:
Radiac Cut-Off Machine*, Apr 3 p 1012

Detroit Aircraft Corporation:
Adopts Metal Fuselage, Apr 10 p 1082

Detroit Vapor Stove Co.:
Straight Line Production*, Feb 13 p 493

Detroit-Windsor Tunnel:
Lining of Welded Steel*, Apr 3 p 985

Deuble, N. L.:
Steels Used for Gears*, Feb 13 p 506

Devereux, W. C.:
Aluminum Alloys, "R. R. 50," for Automobiles, May 15 p 1458

DeVore Co.:
Taken Over by H. K. Ferguson Co., Mar 13 p 836

Dickson, Major T. C.:
Centrifugal Casting of Alloy Steel Guns, May 22 p 1521

Die Casting:
Brass, Mold Wash for, May 8 p 1376
Industrial Progress*, Jan 9 p 155; May 29 p 1599

Die Castings:
For Automotive Field, Mar 27 p 931
Tests of Aluminum and Zinc Base Alloys for, Jan 9 p 157
X-Raying*, Apr 17 p 1135

Die Head:
Modern 14-In. Stationary Self-Opening*, May 15 p 1477
National Acme with Removable Circular Chasers*, June 5 p 1693

Dierker, A. H.:
Reclaiming Steel Foundry Sands*, Feb 27 p 644

Dietert, Harry W.:
Device for Testing Hardness of Molds*, May 1 p 1311

Differentiation:
Is the Next Step Toward? (Editorial), Mar 6 p 741

Disston & Sons, Inc., Henry:
Giant Metal-Cutting Saw*, Feb 13 p 545

Dividends:
Metal-Working Industries, Distribution Seven Years, June 5 p 1688

Docks, Ore:
Chesapeake & Ohio Railroad, June 19 p 1840
Hocking Valley, Feb 20 p 617

Douglas Medal:
Awarded to John Van Nostrand Dorr, Feb 27 p 645

Dover Forge:
Iron Tools and Tongs of the 1860's*, Feb 13 p 525

Dralle, H. E.:
Stretch of Steel Rods in Deep Wells, May 15 p 1462

Drill Stand:
Hisey-Wolf Radial*, Jan 16 p 239

Drilling Machines:
Barnes Front Axle*, June 19 p 1839
Cincinnati Bickford 3-Ft. Radial*, June 5 p 1693
Cincinnati Bickford Master Radial*, May 1 p 1326
Consolidated Boring, Milling and*, Feb 20 p 593
Defiance Cylinder Head*, Jan 30 p 378
Gen-Rad and Hy-Rad*, Mar 13 p 801
Kingsbury, for Cotter Holes*, Jan 30 p 376
Landau Combination Tapping and*, May 22 p 1551
Langelier Five-Way*, Feb 13 p 519; High-Speed Duplex*, May 22 p 1548; Reaming and*, April 10 p 1084
Morse Cobalt Steel, Jan 9 p 160
United States Electrical with Bohnalite Housings*, Apr 3 p 1012

Driver-Harris Co.:
American Rights for New Copper Alloy*, Mar 6 p 727

Drives:
Gears & Forgings Two-Speed Mill, Jan 16 p 240
Morton Motor*, Jan 9 p 161
Motor-Driven Rolling Mill Table*, Feb 6 p 437
Westinghouse Double Gear Unit Mill, Apr 10 p 1086

Drum:
Welded Alloy Steel, Test Pressure*, June 19 p 1809

DuBrul, Ernest F.:
Better Control of Production, Mar 13 p 794
Machine Tool Industry, What Seems to Be Ahead, May 29 p 1617

Duplex Steel Process:
German and American Compared, June 12 p 1760
Methods of Control of Slag and of Oxidation, Mar 27 p 925

Duplexing:
Iron Castings with Electric Furnace*, May 8 p 1372

du Pont de Nemours & Co., E. I.:
Acquires Roessler & Hasslacher Chemical Co., Apr 17 p 1170

Dura Co.:
Conveyor System*, Apr 10 p 1061

Dust, Flue:
Reduction in Blast Furnace Practice, Jan 2 p 39

Dwellings:
Home Modernization, June 5 p 1663
Steel for, May 29 p 1609

E

Earning Power:
Our Unimpaired (Editorial), Jan 9 p 168

Earnings:
Bethlehem Steel Corporation, Annual, Jan 30 p 386; Mar 20 p 875
Metal-Working Industries, Distribution, Seven Years, June 5 p 1688
Steel Companies Show Three-Year Cycle*, Jan 2 p 86
Steel Corporation Annual, Jan 30 p 386; Mar 20 p 871

Eastern States Blast Furnace and Coke Oven Association:
Handling Materials and Stack Size Trend Discussed, Mar 6 p 737

Eastern Steel Castings Co.:
Conveyor System in Jobbing Foundry*, Mar 20 p 853

Eaton Axle & Spring Co.:
Bumper Manufacture*, Apr 24 p 1217
Drawn Stampings of Rustless Steel*, June 12 p 1755
Merger with Wilcox-Rich Corporation, Feb 27 p 665

Eaton, C. S.:
Director Youngstown Sheet & Tube Co., Apr 24 p 1264

Economic Council:
Proposed by President Hoover, May 8 p 1407

Economic Status (Editorial), June 26 p 1914

Economics:
Popular and Otherwise (Editorial), Mar 27 p 950

Edelblute Co., T. H.:
Puller Jack*, Feb 13 p 520

Editorials:
Accidents, Irreducible Minimum, Apr 17 p 1180
Aluminum, Structural Shapes of, Mar 13 p 813
American Rolling Mill Co. to Manage British Plant, Feb 20 p 600
Atlanta—Advertising a City, Apr 3 p 1027
Automobile Output, Stabilizing, Jan 9 p 170
Automobile Production Consistent, June 26 p 1916
Automobile Production, Variations in, Feb 6 p 458
Automobiles as a Trade Index, Jan 23 p 323
Bethlehem-Youngstown Merger—Battle of Giants, Mar 20 p 882
Building, Campaign to Speed Up, Feb 6 p 456
Building, High Cost of, Feb 27 p 666
Building, Home, Apr 17 p 1179
Building, Room for Residential, June 26 p 1914
Building Situation, An Anomalous, Jan 30 p 388
Business Activity—Not Aiming to Build Pyramids, Jan 30 p 388
Business, Big and Lesser, May 15 p 1482
Business Depression, Initiative in, Apr 3 p 1026
Business, Is There Now a Long Swing in? May 29 p 1630
Business—Seeking Good and Bad Spots, Mar 13 p 812
Business—Why Minimize Signs of Betterment? Jan 23 p 322
Buying and Selling, Reciprocity in, Mar 20 p 883
Capacity, Steel, Four Years, May 15 p 1483
Capital, Supplies of, Feb 13 p 530
Car Loadings Show No Trade Gain, May 29 p 1630
Cars, Freight, in Service, 1926-1929, June 19 p 1847
Cement and Structural Steel, Ratio, 1913-1929, Feb 13 p 530
Census Taking, Apr 24 p 1245
Coal and Power, World's, May 1 p 1340
Convention Entertainment Abuses, Feb 20 p 598
Copper Prices—Too Much Stability, Apr 24 p 1245
Costs, Novelties at Less Than, Feb 13 p 530
Differentiation, Is the Next Step Toward? Mar 6 p 741
Doctor Points the Way, Feb 6 p 457
Earning Power, Our Unimpaired, Jan 9 p 168
Earning Time, Shortening, May 8 p 1408
Economic Status, June 26 p 1914
Economics, Popular and Otherwise, Mar 27 p 950
Economics, Remarks on Current, Apr 24 p 1245
Efficiency, Opposite Results of, May 15 p 1483
Employment, Will to Stabilize, Apr 24 p 1244
Engineers in Government Service, Apr 17 p 1179
Exports, Finished Steel Predominates, Jan 30 p 389
Foreman a Manager, Mar 13 p 814
Foundry a Robust Institution, May 1 p 1339
Freight Cost Adjustments, New, May 22 p 1560
French Imports of Manganese Ore, May 1 p 1338
Fuel and Water Power, Mar 6 p 742
Income, National, Exaggerated, Jan 9 p 169
Industry's Dependence on Industry, Jan 23 p 322
Industry's Turning to Government Aid, June 19 p 1847
Instalment Buying in a Depression, June 5 p 1702
Instalments, House Repairs on, Apr 10 p 1099
Labor—Short Work, Short Buying, May 22 p 1561
Living, Still Higher Scales of, May 29 p 1631
Living, Wealth and Habits of, Feb 27 p 667
Machinery and Unemployment, June 26 p 1915
Machinery Industry, Lack of Organization, Jan 2 p 107
Management—Time for the Question Mark, June 12 p 1772
Marketing—Commercial Man Is in the Saddle, May 1 p 1338
Metal Furniture, Glorifying, May 8 p 1409
Metallurgical Education, Trends, Feb 27 p 667
Metals, Dull Days for Other, Jan 16 p 251
Metals, Non-Ferrous, Mar 6 p 740
Metals, Secondary, Apr 10 p 1098
Motor Transport Trends, Feb 13 p 531
News, Reporting, Apr 10 p 1099
Nickel, Romance of, Mar 20 p 883
Over-Production, Cures for, May 8 p 1409
Populism, Feb 20 p 599
Price Declines Incoherent (Commodities), May 22 p 1561
Price Slashes and Business Recovery, Jan 9 p 168
Prices of Farm and Other Products, Jan 9 p 169
Prices, Steel and Profits, May 22 p 1562
Prosperity, Basic Principles of, Jan 30 p 389
Racketeering—Must Chicago Show the Way? Mar 6 p 742
Rails, Heavier and Heavier, Apr 3 p 1028; Apr 10 p 1100
Rails Heavier Are Cheaper, June 12 p 1773
Research Grows Apace, Apr 17 p 1179
Russia, Trouble Ahead for, Feb 13 p 531
Scrap, High Price of, Mar 27 p 951
Scrap, International Movements, Apr 24 p 1245
Scrap Steel, Why Has It Declined? June 5 p 1702
Setbacks in Industries and Shares, June 5 p 1703
Silver, Fall of, Apr 3 p 1026
Smaller Plants Hold Their Own, June 19 p 1846
Speculation—More Chance for the Job, Jan 16 p 251
Spending and Saving, Feb 6 p 456
Spending, Individual and Corporate, Jan 16 p 250
Sponge Iron Versus Scrap, Mar 13 p 814
Statistics, Super, Needed, April 17 p 1178
Steel, an Average Year in, Mar 20 p 882
Steel and General Trade, May 8 p 1408
Steel Capacity, Increasing, Jan 16 p 251
Steel Corporation's Annual Report, Mar 27 p 951
Steel Demands of Metal Consuming Industries, Jan 2 p 106
Steel Deserves a Fair Profit, Feb 6 p 457
Steel Distribution Hard to Follow, Mar 13 p 812
Steel, Finished, Tonnage 1929, June 12 p 1774
Steel Industry—What of 1930? Jan 2 p 106
Steel, New Uses for, May 15 p 1482
Steel Output Almost Normal, Apr 24 p 1245; May 1 p 1338
Steel Production Will Be Steady, Jan 2 p 107
Steel Profits Per Ton, Apr 3 p 1027
Steel, Steadiness in, Feb 20 p 598
Steel, Structural, Large Growth, Jan 23 p 323
Steel's Growth, Size Helps, Feb 20 p 599
Stock Market Returns, Mar 13 p 813
Tariff Aspects, June 12 p 1772
Tariff, Metal Duties Stay, June 19 p 1846
Thrift Again Has Its Day, May 22 p 1560
Trade Nearly Normal, Feb 27 p 666
Tungsten Carbide Tool Developments, Mar 6 p 740
Unemployment, Appearances as to, Apr 17 p 1178
Unemployment, Greater Study Needed, Apr 10 p 1098
Unemployment, Myth of Technological, June 12 p 1773
Unfilled Tonnage Barometer, May 15 p 1483
Wages, American, and "Comforts," June 5 p 1703
Warner & Swasey Co. 50th Anniversary, May 29 p 1631
Welded Drums for Super-Power, May 1 p 1339
Wheat Market, Playing the, Mar 20 p 884
Welding Applications, Jan 23 p 322

Education:
And Training for Industry, Jan 9 p 170

Efficiency:
Opposite Results of (Editorial), May 15 p 1483

Egan, H.:
Paint Coatings and Strength of Riveted Joints, Mar 27 p 917

Eichenberg, G.:
Correlation of Blast Furnace Output with Diameter, June 12 p 1740

Ejector:
Watson-Stillman Hydraulic Cross-Head Pin*, June 19 p 1839

Elco Tool & Screw Corporation:
Screw Manufacture*, May 8 p 1377

Electric Eye:
General Electric for Controlling Light*, May 1 p 1328
Westinghouse, for Determining Temperature or Illumination*, Apr 24 p 1231

Electric Hoist Manufacturers Association:
Officers, Apr 10 p 1091

Electric Storage Battery Co.:
Battery for Trucks*, May 8 p 1392

Electrode:
Lincoln Welding, for Thin Sheet, June 5 p 1701

Electrolene:
As a Hydrogen Substitute, Apr 17 p 1170

Electroplate:
Should Be Chosen According to Service Required, June 5 p 1680

Electroplating:
Progress in*, Jan 2 p 49

Elgin, Joliet & Eastern Railroad:
Sued by Government, June 26 p 1933

Elhero Watch Co.:
Stainless Steel Watches*, May 15 p 1461
Elwell-Parker Electric Co.:
Lift Trucks, Side-Dump and End-Dump*, Feb 13 p 519
Endicott, DeWitt:
Artistry in Metal*, May 29 p 1591
Engineer:
In Government Service (Editorial), Apr 17 p 1179
What He Has Yet to Do, May 8 p 1379
Why Government Needs the, Apr 17 p 1171
Engineering Congress:
World*, Jan 16 p 223; Jan 23 p 298
Engineering Council:
(See American Engineering Council)
Engineering Graduates:
Code for Employment of, Apr 10 p 1078
Training Course in Westinghouse Plant*, June 12 p 1741
Engineering Inspection Association:
(See National Engineering Inspection Association)
Engines:
Packard Diesel, for Aircraft, May 1 p 1336
Engraving Machine:
Simplex*, June 12 p 1761
Entertainment:
Lavish, at Conventions Condemned, Feb 6 p 480; (Editorial), Feb 20 p 598
Equilibrium Diagram:
For Iron-Silicon*, May 8 p 1385
Estate Stove Co.:
Conveyor-Type Enameling Furnace*, Mar 27 p 946
Etching:
Deep, Test of Brass, June 12 p 1745
Evans, Dr., Ulick:
Reproducibility in Corrosion Work, June 12 p 1754
Exhibitions:
American Foundrymen's Association, Exhibitors, May 1 p 1313
American Foundrymen's Association, New Equipment*, May 1 p 1299; May 8 p 1392; May 22 p 1540
Leipzig Fair, May 29 p 1618
Exports:
American and European Practice, Feb 20 p 584
Automotive Products, Value, 1929, Feb 20 p 597
Copper, 1929, Feb 13 p 558
Farm Implements, First Quarter, May 8 p 1436
Finished Steel Predominates (Editorial), Jan 30 p 389
Iron and Steel, by Months, November, p 205; December and Year, p 415; January, p 767; February, p 1010; March, p 1437; April, pp 1653, 1876; May, p 1927
Iron and Steel Values, 1928, 1929, Feb 13 p 556
Leading Countries, 1929, Jan 2 p 82
Machinery, Value, by Months, November, p 207; December, p 419; January, p 769; February, p 1051; March, p 1439 April, p 1729
Machinery, Industrial, 1922-1929*, p 595; January, p 870; Year 1929, p 1269*; Four Months, p 1724
Machinery, Oil Well and Refinery, 1929, June 19 p 1870
Machinery Record, 1929, May 22 p 1589
Scrap, 1929, Feb 13 p 559
Steel, Distribution 1929, Feb 6 p 485; First Quarter, May 8 p 1438
Tractors, 1922-1929*, May 15 p 1507
World Trade on the Mend, May 29 p 1615
Extras:
On Wide High-Finished Sheets, Mar 6 p 770

F

Fabricated Plate:
Orders, December and Year 1929, p 337; January, p 669; February, p 949; March, p 1334; April, p 1698
Fabricated Structural Steel:
Bookings and Shipments, December and Year, p 348; January, p 618; February, p 904; March, p 1268; April, p 1552; May, p 1941
Consumption, Jan 2 p 94
Fabricating Plant:
R. C. Mahon Co.*, Jan 9 p 151
Fabrication:
By Welding, Westinghouse Shop*, Feb 20 p 585
Facing Machine:
Thomas Column*, Jan 9 p 160
Fafnir Bearing Co.:
Small Sealed Ball Bearings, Mar 13 p 802
Fairbanks, Morse & Co.:
Centennial of Platform Scale, Feb 27 p 644
Fairless, B. F.:
President Union Drawn Steel Co., May 15 p 1481
Falk Corporation:
Speed Reducers*, Feb 6 p 447
Farmers:
Buying Power Increases, Jan 2 p 30
Fans:
Coppus Aeroplane Heat Killer*, Apr 24 p 1231
Farrell, James A.:
Business Back to Sound Basis, May 15 p 1447
World Trade is on the Mend, May 29 p 1615
Faurote, Fay L.:
Straight Line Production of Stoves*, Feb 13 p 493
Fay & Egan Co., J. A.:
Double-Arbor Universal Saw*, Jan 9 p 162
Surfacing Machine*, Apr 3 p 1012
Federal Press Co.:
75-Ton Capacity Inclinable Press*, June 19 p 1837
Feeds:
Hydraulic, Applied to Betts Car Wheel Borer*, May 22 p 1548
Laidlaw Hydraulic, for Band Saws*, June 26 p 1905
Feiker, Frederick M.:
Merchandising and Selling, Jan 9 p 172
Feild, Alexander L.:
Rate of Carbon Elimination and Degree of Oxidation in Open-Hearth, May 8 p 1386
Ferro Machine & Foundry Co.:
Gasoline Pump Manufacture*, June 19 p 1805
Ferroalloys:
Production, 1929, Apr 3 p 1022
Ferrous Magnetic Corporation:
Consulting Laboratory for Iron and Steel, Apr 10 p 1092
Fetherston, T. C.:
Requirements for Welding Jigs*, Mar 20 p 862
Field Museum:
Iron Workers of Tinguian Tribe*, June 26 p 1890
Filing Machine:
Rausch Die, Apr 10 p 1086
Findley, Alvin I.:
Retires as Editor-in-Chief of THE IRON AGE*, Apr 17 p 1149
Finland:
High-Grade Iron Ore Deposits, May 1 p 1337
Firth & Sons, Ltd., Thomas:
Hardness Testing Machines*, May 8 p 1397
Firth-Sterling Steel Co.:
Tungsten Carbide Mechanigript Tip*, Feb 27 p 663
Fisk, Dr. Eugene Lyman:
Hiring Age Limit, Feb 6 p 453
Fiske, Rogers A.:
Hot-Strip Mill of Acme Steel Co.*, Mar 20 p 846
Relocated Equipment Boosts Foundry Output*, Feb 6 p 438
Fissures:
Transverse, Present Status of Problem, May 22 p 1531
Tranverse, Tests by Detector Car, May 29 p 1610
Fitzgerald, F. J.:
Service Piping for Welding Gases*, Feb 20 p 575
Flanders, Ralph E.:
Appraisal of Machine Tool Situation, Jan 2 p 62
Flanging Machines:
Blue Valley, with Roller Bearings*, Jan 16 p 238
Flat Rolled Steel Manufacturers:
(See National Association of Flat Rolled Steel Manufacturers)
Fluorspar:
Shipments, 1929, Apr 10 p 1123
Ford Motor Co.:
Expansion Plans, Jan 2 p 122
Forming and Polishing Rustless Steel Radiator Shells*, June 26 p 1887
Use of Rustless Steel*, Feb 20 p 594
World Production 1929, Jan 16 p 283
Foreman:
Key Man in Organization, June 26 p 1877
Training, Roebling's Night School for*, Apr 10 p 1059
Foreman-Manager:
American Rolling Mill Co. Plan, Mar 13 p 777, (Editorial) p 814
Forging:
Artistic Wrought Iron Household Articles*, Apr 10 p 1081
Proper Temperature for, May 15 p 1485
Forgings:
Alloy Steel, Snow Flakes in*, May 8 p 1380
Controlling Fiber in*, May 22 p 1522
Developments in Heavy, Jan 2 p 41
Drop, Made in Baldwin Locomotive Works*, Apr 3 p 1005
Drop, Outlook, Jan 2 p 96
Midvale Record Size*, Feb 13 p 518
Nickel Alloy Steel for, Feb 13 p 515; Mar 20 p 851
Nickel - Chromium Molybdenum Steel, May 1 p 1341
Nitriding in Camden Forge Plant*, Mar 13 p 788

Foster Bolt & Nut Co.:
Merged with Lamson & Sessions Co., Jan 9 p 195

Foundries:
Brass, Overcoming Alloy Ingot Troubles in, June 12 p 1745
Conveyor System in Eastern Plant*, Mar 20 p 853
Cost Methods, Uniform Needed, June 26 p 1883
General Electric, Handling System at Pittsfield Plant*, Apr 10 p 1069
General Steel Castings Co., Air View*, May 1 p 1296
Gray Iron, Metallurgical Trends in, May 1 p 1319
Gray Iron, Operations, January, p 770; February, p 1019; March, p 1356; April, p 1662
Jones, Relocated Equipment Boosts Output*, Feb 6 p 438
Loss Reduced by Elimination of Gaggers, May 15 p 1462
Malleable Iron Practice, May 22 p 1532
Materials Handling in Small, Feb 20 p 586
Mechanizing Ohio Brass Plant*, Feb 20 p 567
Monel Metal and Nickel Casting Practice, June 12 p 1754
Nash Production Units at Kenosha*, Apr 17 p 1138
Ohio Steel, Manufacture of Rustless Steel Castings*, Apr 3 p 993
Personnel Management, May 29 p 1605
Profits, Why Not? Mar 27 p 936
Steel, Capacities of United States and Canada, Jan 2 p 59
Steel, Proper Sand for, May 22 p 1523
Steel, Reclaiming Sands*, Feb 27 p 644
Uniform Trade Customs, Jan 9 p 191
Wilson, Mechanized Details Augment Output, Apr 17 p 1143

Foundry Equipment:
Orders, November, p 187; December, p 349; January, p 623; February, p 977; March, April, p 1701

Foundry Equipment Co.:
Vertical Conveyor Type Oven*, May 1 p 1312

Foundrymen's Associations:
American, Awards Penton Gold Medal to H. A. Schwartz*, Jan 9 p 167; Convention Exhibitors, May 1 p 1313; Convention Program, Apr 17 p 1169; Apr 24 p 1238; Exhibition of New Equipment*, May 1 p 1299; May 8 p 1392; May 22 p 1540; New Monthly Journal, Mar 6 p 730; News of Cleveland Convention*, May 15 p 1478; May 22 p 1539; Regional Meeting, Apr 3 p 1018
Newark, Officers, June 5 p 1699
New England, Officers, Jan 16 p 244
Quad City, Regional Meeting, Apr 3 p 1018

Fox, Gordon:
Russian Steel Mill Expansion, Jan 16 p 225

France:
Iron and Steel Output, January, February, Apr 24 p 1268
Manufacture of Bronze Alloys, Feb 13 p 545
Mills Developing Stainless Steels, Jan 23 p 348
Special Structural Steels, Mar 13 p 815; June 19 p 1848
Tariff on Motor Cars, Feb 27 p 702

Frank, Thomas B.:
Costs—Workman Needs Data More Than Key Men, June 26 p 1879

Frankland, F. H.:
H-Sections Used to Support Buildings on Made Ground, Feb 6 p 437

Frary, Dr. Francis C.:
Present Day Aspects of Aluminum Industry, Feb 20 p 600

Freeland, W. E.:
Trends in Market Management, Jan 2 p 70

Freeman and Quick:
Secondary Brittleness in Rail Steel*, Mar 6 p 714

Freight Rates:
Chicago-Milwaukee to Stand, May 15 p 1506
Chicago to Coast Reduced, May 29 p 1642
Chicago to Nearby Points Suspended, May 22 p 1556
Coal to Youngstown, Apr 3 p 1043
Decisions, Jan 16 p 246; May 15 p 1504
Iron and Steel Products to Detroit Prejudicial, Mar 13 p 811
Mileage for Scrap Suggested, June 5 p 1701
Pig Iron in Buffalo District Not Unreasonable, Apr 3 p 1021
Pig Iron in New England, June 12 p 1767
Pig Iron, Southern, to East, Apr 17 p 1181
Pittsburgh and Chicago to Western Consuming Points in Effect, May 22 p 1555, (Editorial), p 1560
Pittsburgh Opposes Rise in Official Classification Territory, Apr 3 p 1021
Rail-Water to Texas Not Justified, Jan 16 p 246
Scrap, from Newport News, Jan 23 p 337
Scrap, Southwest Dealers Ask Reduction, June 19 p 1834
Steel to Topeka, Apr 17 p 1177
To New England from Principal Producting Points, Old and New, May 22 p 1555, (Editorial) p 1560
Tri-Cities Lose Appeal, Mar 27 p 977

Freyn Engineering Co.:
To Build Steel Plant in Siberia*, June 19 p 1842

Frick Coke Co., H. C.:
Buys Washington Coal & Coke Co., June 19 p 1832

Friday, David:
Management Burden on Next Decade, May 8 p 1388

Fry, Lawford H.:
Heavy Forgings, Developments, Jan 2 p 41

Fuel:
Butane for Industrial Heating, May 15 p 1478
For Heat Treating*, Jan 2 p 58; Jan 9 p 148
Incinerator Equipment for Operating Plant Without Cost of*, June 5 p 1686

Furman, W. F.:
Castings That Withstand Heat and Corrosion*, May 1 p 1277

Furnaces, Blast:
Bulldog Slag as Related to Steel, May 15 p 1457
Correlation of Output with Diameter, June 12 p 1740
Developments*, Jan 2 p 37
Filling and Size Segregation, Apr 24 p 1222
Flue Dust Reduction, Jan 2 p 39
Handling Materials at, Mar 6 p 737
Operations, Changes in, May 15 p 1505
Practice, and Heat Transfer Problems, May 1 p 1340
Production by Months, December, p 174; January, p 460; February, p 745; March, pp 1023, 1102; April, p 1412; May, p 1706
Stack Size Trend, Mar 6 p 737
Weirton Record Reconstruction, Apr 17 p 1166
Wisconsin Steel Co. Replaces 50-Year Old*, June 12 p 1751

Furnaces, Electric:
Ajax High-Frequency*, May 1 p 1301
Ajax Zinc Melting*, May 1 p 1305
Bluing, for Automobile Piston Rings*, Apr 10 p 1083
Conveyor-Type Enameling*, Mar 27 p 946
For Heat Treating*, Jan 30 p 357
For Melting Red Brass, June 12 p 1747
Heavi Duty Nitriding, Mar 6 p 770
Hevi Duty Rotary Retort Carburizing*, June 26 p 1908
High-Frequency and Arc Compared, Apr 17 p 1180
Iron Castings Duplexed with Cupola*, May 8 p 1372
Iron, Status of, June 12 p 1753
Making Gray Iron from Steel Scrap, Mar 6 p 725
Norskalloy Pig Iron from, Feb 13 p 508
Production of Gray Iron in, Feb 13 p 532
Russ Induction, Apr 10 p 1092
Westinghouse, for Heating Small Parts*, Apr 24 p 1214

Furnaces, Gas:
Babcock & Wilcox Laboratory*, Feb 6 p 448
For Annealing Castings*, Feb 27 p 637; Mar 27 p 952
For Lead Hardening of Shovels*, June 26 p 1880

Furnaces, Heating:
Natural Gas-Fired Skelp*, May 22 p 1534

Furnaces, Melting:
Kindt-Collins Twin Pot*, May 1 p 1312

Furnaces, Nitriding:
Heavi Duty Small Electric, Mar 6 p 770
Westinghouse Bell Type, June 26 p 1907

Furnaces, Normalizing:
Continuous, for Sheet Steel, Feb 13 p 517; Feb 27 p 668

Furnaces, Open-Hearth:
Absorption of Sulphur from Coal, June 12 p 1759
Alloy Contamination of Steel, June 5 p 1671
Combustion Control, June 5 p 1669
Construction, May 29 p 1601
Control, Symposium on, June 26 p 1889
Determining Iron Oxide in Liquid Steel*, May 8 p 1386
Developments in 1929, Jan 2 p 35
Pouring Practice, May 29 p 1603
Rate of Carbon Elimination and Degree of Oxidation in, May 8 p 1386
Refractories, May 29 p 1602

(Furnaces, Open-Hearth, *Continued*)
Shop Organization, May 29 p 1603
Talbot Process in German Plant, Jan 23 p 309
Using Natural Gas in, May 29 p 1602

Furnaces, Rotating:
In French Foundry for Melting Gray Iron, June 19 p 1817

Furness, J. W.:
Industrial Uses of Nickel, Apr 10 p 1087

Furniture:
Metal, Glorifying (Editorial), May 8 p 1409

G

Gage:
Brown & Sharpe Car Wheel*, June 5 p 1694
Brown & Sharpe Combination Depth and Drill Point*, Feb 13 p 521
Brown & Sharpe Depth Attachment for*, Feb 27 p 663
Brown & Sharpe Screw*, May 1 p 1331
Meriam Cushioning Device for*, Apr 10 p 1085
Prosser, for Grinding Tungsten-Carbide Tools*, Apr 24 p 1232

Gallaher, E. B.:
Says Buying Out of Future Income Caused Depression, Jan 30 p 383

Galland-Henning Mfg. Co.:
Hydraulic Scrap Baling Press*, Mar 6 p 729

Galvanizing:
Bending Conditions of*, May 15 p 1452; May 22 p 1528

Galvanizing Pots:
Destruction of*, Jan 23 p 294; Feb 27 p 633; Mar 27 p 933
Life of, Apr 17 p 1154

Gan-Van-Alloy Steel Sheets, Jan 16 p 272

Gardner-Denver Co.:
Hoists, Nos. 8 and 10*, May 8 p 1397
Synchronous Motor-Driven Air Compressors, Feb 27 p 662

Garrison Gear Grinder:
Acquired by Pratt & Whitney Co*, June 19 p 1838

Gary Memorial Medal:
Presented to Charles M. Schwab, May 15 p 1463

Gas Lines
Natural, Expansion 1929, Jan 2 p 20

Gases:
Mixing for Industrial Use, Jan 16 p 219
Natural, Control in Open-Hearth Furnaces, May 29 p 1602
Welding, Service Piping for*, Feb 20 p 575

Gaston, W. I.:
Welded Line Joints for Steel Pipe*, Feb 6 p 435

Gathmann, Emil:
Designing Ingots for Good Surfaces*, Jan 9 p 158

Gears:
American Gear Manufacturers' Standards, May 8 p 1394
Steels Used for*, Feb 13 p 506

Gears & Forgings, Inc.:
Three-Speed Reducer, Jan 16 p 239
Two-Speed Mill Drive, Jan 16 p 240

General Electric Co.:
Cleaning Steel Castings*, Mar 6 p 730
Electrolene as Hydrogen Substitute, Apr 17 p 1170
Employee Bond Subscriptions, Feb 13 p 557
Handling System in Pittsfield Foundry*, Apr 10 p 1069
New Switchboard Panels, Feb 27 p 662
Photo-Electric Relay for Controlling Light*, May 1 p 1328
Unemployment Plan, June 26 p 1939
Welding Machine with Current Regulator, Mar 6 p 735
Welding Process, Unique, a By-Product of Research*, June 5 p 1684

General Radial Drill Co.:
Gem-Rad and Hy-Rad Drilling Machines*, Mar 13 p 801

General Steel Castings Corporation:
Air View of Foundry*, May 1 p 1296
Sand Blast and Dust Collecting System, Jan 9 p 193
Service Records in Commonwealth Division, Jan 16 p 252

Genfire Steel Co.:
Portable Steel Buildings, June 19 p 1845

Gerken, T. H.:
Jobbers Position Improved, Jan 2 p 28
New Sheet Mill of Newton Steel Co.*, Apr 10 p 1064

Germanium:
As a Coating for Steel, June 12 p 1752

Germany:
Exports and Imports of Iron and Steel, 1929, p 558; January, February, p 1050
Exports and Imports of Non-Ferrous Metals, 1929, Feb 27 p 694
Iron Ore Imports, First Quarter, June 19 p 1870
Largest Continental User of Steel Ties, Mar 6 p 804
Machinery Business, Feb 6 p 484
Steel Cartel Renewed for 10 Years, Jan 9 p 204
Talbot Process in Steel Furnace*, Jan 23 p 309

Gibbons Brothers, Ltd.:
Charging Machine for 60-Ft. Plates*, June 26 p 1884

Gilbreth, Dr. Lillian M.:
Furthering Business with Japan, Feb 6 p 443
Impressions of Industrial Japan, Jan 30 p 373
Scientific Management in Japan, Jan 23 p 298
World Engineering Congress*, Jan 16 p 223

Gill, James P.:
Rational Choice of Tool Steels*, Mar 13 p 782

Gingerich, E. M.:
Stronger Aluminum Castings by Improved Foundry Practice, May 29 p 1598

Girarder, L. F. C.:
Simplified Methods for Controlling Production of Cast Iron, June 5 p 1680

Gisholt Machine Co.:
Resharpening High-Speed Hacksaw Blades, Apr 10 p 1083

Glasgow Iron Co.:
Iron Mill to be Scrapped, Feb 13 p 560

Globe Tapping Machine Co.:
Automatic Multiple-Spindle Tapping Machine*, Feb 6 p 448

Goodale, Paul L.:
Behavior of Sand Molds in Steel Foundries, May 22 p 1524

Goodell, Frank:
Major Sales Problems of 1930, May 8 p 1388

Graduates, Engineering:
Code for Employment of, Apr 10 p 1078
Westinghouse Student Course*, June 12 p 1741

Graham and Meisse:
Deep-Etch Test of Brass, June 12 p 1745

Graver Corporation:
Purchased by Phoenix Mfg. Co., May 15 p 1481

Graves, W. H.:
Sheet Steels for Automobiles*, Mar 27 p 931

Gray Iron Institute:
Annual Meeting Announcement, May 1 p 1337
Foundry Operations, January, p 770; February, p 1019; March, p 1356; April, p 1662
New Chapters, Apr 3 p 1018
To Have Research Engineer, Apr 24 p 1242

Great Britain:
Bars, Basic Bessemer Steel Specification, June 12 p 1796; June 26 p 1913
Exports and Imports of Iron and Steel, January, February, p 878
Pig Iron and Steel Output, December, p 248; January, p 597; February, p 879; March, p 1196; April, p 1478; May, p 1870
Rationalization Progress, Mar 13 p 803
Steel Tariff Urged, June 5 p 1727
Wide Uses of Stainless Steel, Jan 16 p 248

Grede, William J.:
Molybdenum in Cast Iron, Jan 16 p 252

Green Bay Barker Machine & Tool Works:
Acquires Line of Rockford Drilling Machines, Apr 17 p 1163

Greenville Steel Car Co.:
Acquired by Pittsburgh Forgings Co., Jan 30 p 384

Greiner and Stoughton:
Iron-Silicon Equilibrium Diagram*, May 8 p 1385

Gries, Dr. John M.:
Chart of Plan to Stabilize Business*, Mar 13 p 810

Grinder Head:
Cincinnati Planer*, Jan 23 p 317

Grinding Machines:
Buckeye, with Low Air Consumption*, May 1 p 1305
Cleveland Swing Crane*, Feb 13 p 552
Developments, Jan 2 p 54
Hammond Double-Disk*, Mar 20 p 868
Independent Rotary Pneumatic*, Jan 16 p 239
Jarecki Internal*, Jan 30 p 381
Landis Hydraulic Roll*, Jan 23 p 318
Madison-Kipp for Die Work*, Feb 6 p 447
National-Cleveland Gear*, Mar 6 p 732
Norton Roll*, May 29 p 1624
Ransom MWR*, Feb 6 p 451

Grover, Albert E.:
Uniform Cost System, May 1 p 1322

Grubb, A. A.:
Non-Ferrous Practice in Small Foundry, Feb 20 p 586
Grünewald Process:
For Bright Annealing*, Apr 3 p 1002
Guards:
Ranson Grinder Wheel*, May 8 p 1398
Gulf States Steel Co.:
New Blooming Mill Operating, Mar 27 p 958
Proxy Fight for Control of, Mar 6 p 764; Mar 20 p 880
Ready to Start New Plate Mill, June 26 p 1942
To Build Continuous Sheet Mill, Jan 16 p 246
Guns:
Alloy Steel Cast Centrifugally, May 22 p 1521

H

Hacha, L.:
Basic Bessemer Steel for Rails, Mar 20 p 860
Hammer:
Base of Two Steel Castings*, May 8 p 1407
Ingersoll-Rand High-Speed Chipping*, Feb 20 p 592
Nazel Heavy-Duty Air*, Mar 13 p 800
Hammond Machinery Builders, Inc.:
Double Disk Grinder*, Mar 20 p 868
Polishing and Buffing Lathe*, Mar 6 p 735
Handy & Harman:
Silver Solder for Stainless Steel, Jan 16 p 238
Haney, Dr. Lewis H.:
Building and Automobile Production, Outlook*, Jan 30 p 379
Business Outlook*, Feb 6 p 449; Mar 27 p 941; Apr 24 p 1233; May 29 p 1621; June 26 p 1903
Commodity Prices, Trend, Feb 13 p 523; Mar 13 p 807; Apr 10 p 1089; May 15 p 1471; June 12 p 1765
Forecast Based on Many Factors*, Jan 23 p 313; Feb 27 p 657; Mar 27 p 941; Apr 24 p 1223; May 29 p 1621; June 29 p 1903
Steel Industry, Production, Prices and Orders*, Jan 16 p 241; Feb 20 p 589; Mar 20 p 873; Apr 17 p 1167; May 22 p 1549; June 19 p 1835
Steel Prices, Apr 10 p 1089; May 15 p 1470; June 12 p 1765
Steel Production and Demand*, Jan 9 p 165; Feb 6 p 449; Mar 6 p 733; Mar 20 p 873; Apr 3 p 1015; May 8 p 1399; June 5 p 1695
Hanna Iron Ore Co.:
Leases Lake Superior Iron Mines, Jan 16 p 246
Hardening:
Iron Alloys with Nitrogen, May 29 p 1608
Hardness:
In Steel, Cause of, Feb 13 p 501
Hardy, Dr. Charles O.:
Bottom of Business Recession Reached, May 22 p 1553
Business Indications Not Conclusive, Apr 17 p 1159
Business Malajustment Temporary*, Mar 20 p 865
Business Recovery and Prices of Raw Materials*, Jan 23 p 319
Favorable Factors Indicate Early Revival in Business, June 19 p 1833
Rapid Business Recovery in Prospect, Feb 20 p 588
Harnischfeger Corporation:
Establishes Foundation for Employees, Jan 16 p 244
Harrison, Perry G.:
Sintering Limonitic Iron Ores*, Feb 27 p 642
Hartman, F. V. and E. F.:
Aluminum Alloy Crane*, June 5 p 1689
Harvard Award:
Given to Paul W. Stewart for Market Data Handbook, Mar 6 p 769
Hatfield, Dr. W. H.:
Heterogeneity in Steel Ingots and Its Amelioration, Jan 30 p 368
Hawley-Smoot Tariff Bill:
Metal Schedule Rates, Apr 17 p 1173
Hay, W. W.:
Closed Markets Limit Mass Output*, Jan 2 p 82
Closing of Markets in Consumer Goods*, June 26 p 1891
Steel Earnings Show Three-Year Cycle*, Jan 2 p 86
Haydock, Robert S.
Cleaning Billet Surface by Machine*, Jan 30 p 366
H-Beams:
To Carry Power Wire, June 26 p 1892
Heat:
Transfer Problems and Blast Furnace Practice, May 1 p 1340
Waste, Economies Through Use of*, June 5 p 1681
Heat Insulating Material:
Carey Aluminite, May 8 p 1410
Heat Treating:
Alloy Steel Castings—Three Methods, June 19 p 1821
Department in Stanley P. Rockwell Plant, Jan 30 p 375
Electric Furnaces for*, Jan 30 p 357
Electric Furnace for Small Parts*, Apr 24 p 1214
Furnaces in Dayton Forging & Heat Treating Plant*, May 15 p 1449
Gas Furnaces for Castings*, Feb 27 p 637; Mar 27 p 952
Gas Furnace for Lead Hardening*, June 26 p 1880
Fuels for*, Jan 2 p 58; Jan 9 p 148
Structural Steel*, Feb 13 p 510
Teaching at University of Illinois*, Mar 27 p 915
Heater:
Bellevue Electric Soldering Iron*, Mar 20 p 869
Hepburn, W. M.:
Making Wire Wheel Hubs*, Feb 20 p 571
Herman Pneumatic Machine Co.:
Molding Machines, Rollover and Stripper*, May 1 p 1302
Herrick, George S.:
Chrome-Nickel Alloy Unusual Products*, June 12 p 1735
Packing Products for Export, May 15 p 1461
Herty, Dr. C. H., Jr.:
Determining Iron Oxide in Liquid Steel*, May 8 p 1386
Hevi Duty Electric Co.:
Rotary Retort Carburizing Furnace*, June 26 p 1908
Small Nitriding Electric Furnace, Mar 6 p 770
Highway Construction:
Expenditures Planned, Mar 20 p 897
Much Steel Needed in, Jan 2 p 24
Hill, D. B.:
Conveyors for Core Ovens*, June 5 p 1673
Hills-McCanna Co.:
Grease Pump*, May 15 p 1476
Lubricating Device*, Apr 17 p 1162
Hisey-Wolf Machine Co.:
Radial Drill Stand*, Jan 16 p 239
Hlava, Alois:
New Method of Riveting Joints, June 19 p 1813
Hocking Valley Railroad:
New Ore Docks, Feb 20 p 617
Hoists:
Gardner-Denver Nos. 8 and 10*, May 8 p 1397
Lidgerwood, with Safety Brakes*, Feb 27 p 660
Milwaukee Electric Monorail*, May 8 p 1393
Robbins & Myers Bantam*, May 1 p 1307
Robbins & Myers Electric*, Apr 17 p 1162
Shepard Niles*, May 1 p 1310
Wellman-Seaver-Morgan 200-Ton Car*, Jan 16 p 240
Holden, Thomas S.:
Building Prospect*, Jan 9 p 146
Homerberg, V. O.:
Nitriding, Present and Future of, Jan 2 p 52
Honing Machine:
Barnes Cylinder*, Jan 30 p 381
Hook, Charles R.:
President American Rolling Mill Co.*, Jan 9 p 198
Hoover Business Conference
(See National Business Survey Conference)
Hoover, President:
Awarded Hoover Gold Medal, Apr 17 p 1171
Business Crisis Passed, Outlook Improving, May 8 p 1401
Proposes Economic Council, May 8 p 1407
Hopper, S. J.:
Plant Growth Affects Management, Jan 2 p 75
Houses:
(See Dwellings)
Howard, James E.:
Extension of Service Asked, Feb 20 p 601
Status of Transverse Fissure Problems, May 22 p 1531
Howe Memorial Lecture*, Mar 6 p 719
Howell, E. G.:
Proposes Study of Alloy Steel Scrap, June 26 p 1909
Hoyt, Dr. S. L.:
Hard Metal Carbides and Cemented Tungsten Carbide*, Feb 27 p 646
Hub Caps:
Chrome-Nickel and Chromium Steel*, June 12 p 1755
Hubs:
Manufacture in Wire Wheel Corporation Plant*, Feb 20 p 571
Hudson, Ray M.:
Simplification and Standardization Aids for Better Business, Jan 2 p 73
Hughes, Charles H.:
Cast Iron of High Tensile Strength, May 22 p 1562

Hunt & Son, C. B.:
Polishing Wheel*, Apr 17 p 1163
Hunt Medal:
Awarded to James Aston, Feb 27 p 645
Hunt, Omar S.:
Machine Tool Sales on Instalments, June 12 p 1775
Hurley, Edward N.:
President American Manufacturers' Export Association, Feb 6 p 477
Hydroplanes:
Aluminum Alloy in Construction of French, Feb 20 p 570

I

Imhoff, Wallace G.:
Destruction of Galvanizing Pots*, Jan 23 p 294; Feb 27 p 633; Mar 27 p 933
Galvanizing Pot Life*, Apr 17 p 1154
Imports:
Copper, 1929, Feb 13 p 558
Iron and Steel by Months, November, p 205; December and Year, p 415; January, p 767; February, p 1010; March, p 1437; April, p 1653
Iron Ore and Countries of Origin, November, p 191; December, p 486; January, p 870; February, p 1123; March, p 1410; April, p 1797; May, p 1927
Leading Countries, 1929, Jan 2 p 82
Machinery by Months, November, p 207; December, p 419; January, p 769; February, p 1051; March, p 1439; April, p 1729
Manganese Ore, 1929, June 5 p 1701
Pig Iron and Countries of Origin, November, p 195; December, p 416; January, p 737; February, p 1082; March, p 1428; April, p 1699
Spiegeleisen, 1929, Mar 6 p 768; First Quarter, May 8 p 1407
Incinerator Equipment:
Operating Plant Without Fuel Cost*, June 5 p 1686
Income:
National, Exaggerted (Editorial), Jan 9 p 169
Independent Pneumatic Tool Co.:
Rotary Pneumatic Grinder*, Jan 16 p 239
Index Machinery Corporation:
Hauser Jig Borer*, Jan 23 p 316
India:
Imports of Industrial Machinery, Apr 3 p 1050
Industrial Alloy Products Co.:
Nirosta Steel Watch*, May 15 p 1460
Industrial Apparatus & Instrument Co., Inc.:
Portable Brinell Hardness Tester, June 19 p 1845
Industrial Incinerator Engineering Co.:
Incinerator Equipment*, June 5 p 1686
Industrial Museum:
Engineering Advisers for, Apr 3 p 1020
Industry:
Education and Training for, Jan 9 p 170
Its Dependence on Industry (Editorial), Jan 23 p 322
Turning to Government Aid (Editorial), June 19 p 1847
Ingalls Iron Works:
Buys Pennsylvania Fabrication Co., Apr 17 p 1198
Ingersoll-Rand Co.:
High-Speed Chipping Hammer*, Feb 20 p 592
Ingots, Non-Ferrous:
Unfilled Orders, Feb 20 p 620; Mar 20 p 902; Apr 17 p 1199; June 5 p 1701; June 19 p 1868
Ingots, Steel:
Best Conditions for Pouring, Mar 27 p 920
Capacity, 1929, May 8 p 1418; 10 Years*, May 1 p 1329; Four Years (Editorial), May 15 p 1483
Designing for Good Surfaces*, Jan 9 p 158
Heterogeneity in and Its Amelioration, Jan 30 p 368
Production by Months, December and Year, p 173; January, p 529; February, p 805; March, p 1097; April, p 1403; May, p 1771
Production, United States, 1929, June 12 p 1764
Production, World, 1929, Jan 2 p 81
Inland Steel Co.:
Annual Report, Feb 6 p 478; Apr 10 p 1133; Quarterly Report, May 8 p 1411
Gal-Van-Alloy Steel Sheets, Jan 16 p 272
New Office Building*, May 15 p 1498
Inspection Bureau:
(See Material and Equipment Inspection Bureau)
Instalments:
Buying in a Depression (Editorial), June 5 p 1702
House Repairs on (Editorial), Apr 10 p 1099
Institute of Metals (British):
Annual Meeting Mar 27 p 949
Fall Meeting Announcement, May 1 p 1333
Plans Visit to America, May 1 p 1361
Institute of Scrap Iron and Steel:
Confers on "Direct Dealing," Apr 10 p 1095
Confers with American Iron and Steel Institute, May 15 p 1481
Convention Proceedings, Mar 6 p 757; Mar 13 p 797
Expels Member, Feb 20 p 591
New York Chapter Officers, May 15 p 1481
Organizes Pacific Coast Chapter, May 29 p 1649
Institute of White Metals:
Organized, Feb 20 p 591; Mar 20 p 880
To Incorporate, Mar 27 p 939
Western Division to be Formed, Mar 6 p 730
International Manganese Corporation:
Incorporated to Handle Turkish Manganese, Feb 20 p 617
International Nickel Co.:
New Monel Metal Finish, June 26 p 1942
Interstate Commerce Commission:
Disapproves Welded Gas Containers, Mar 6 p 728
Iron:
Enameled, Causes of Blisters on, May 15 p 1451
Ornamental*, May 29 p 1591
Sponge, Different Grades, Mar 20 p 850
Sponge, Economic Aspects of, Mar 13 p 790, (Editorial) p 814
Sponge, from Brazilian Ore*, May 1 p 1298
Wrought, Artistic Forgings of Household Articles*, Apr 10 p 1081
Wrought, Mechanical Puddling*, June 19 p 1818
Wrought, Old and New in*, June 26 p 1898
Wrought, Strengthened by Cold Rolling, June 19 p 1822
Wrought, Tests of Aston and Hand Puddled Processes, Jan 9 p 147
Iron and Steel Institute (British):
Annual Meeting, May 15 p 1480
Iron and Steel Institute (South African):
Movement to Form, Feb 13 p 545
Iron-Silicon Equilibrium Diagram*, May 8 p 1385
Iron, Steel and Allied Industries of California:
Convention Proceedings, Feb 27 p 649
Ironite:
New Iron Alloy, Feb 27 p 664
Isenburger and St. John:
X-Raying Die Castings*, Apr 17 p 1135
X-Raying Large Steel Castings*, Feb 13 p 499

J

Jackling, D. C.:
Scholarships for Metal Study, Apr 17 p 1176
James, W. A.:
Steel Plant Lubrication Problems, May 15 p 1455
Japan:
Foreign Machinery Needs*, June 12 p 1738
Industrial, Impressions of, Jan 30 p 373
Industrial Practices, Feb 6 p 443
Plans New Rail Mill, Feb 20 p 597
Scientific Management in, Jan 23 p 298
Sheet Imports, 1929, Feb 20 p 597
Jarecki Machine & Tool Co.:
Internal Grinding Machine*, Jan 30 p 381
Jeffries, Dr. Zay:
Future of American Iron and Steel Industry*, (Howe Memorial Lecture), Mar 6 p 719
Light Metals in Automotive Field, Mar 27 p 918
Jennison, H. C.:
Defects in Copper Wire*, Mar 13 p 792
Jig Borer:
Hauser*, Jan 23 p 316
Jigs:
And Fixtures, Manufacture by Welding*, Jan 16 p 232
Welding, Requirements for*, Mar 20 p 862
Jobbers:
Improved Position of, Jan 2 p 28
Johnson Bronze Co.:
Self-Lubricating Bearing, Feb 20 p 593
Johnson, Dr. C. M.:
Rustless Steel for Automobiles and Buses, Mar 27 p 930
Johnson, J. B.:
Alloy Steel Sheets for Aircraft*, Feb 13 p 502
Johnston & Jennings Co.:
Jolt Rollover Mold Machine*, May 1 p 1312

Johnston, John:
Chemistry of Steel*, May 22 p 1536
Steel Corporation Research Program, Jan 2 p 61

Jointer:
Wallace Hand, with Skew Knife Cutterhead*, June 19 p 1837

Jolt Squeezer:
Arcade Portable*, May 1 p 1305

Jones & Laughlin Steel Corporation:
Annual Report, Feb 6 p 478; Quarterly Report, May 1 p 1358
Crawford, George G., President, Jan 30 p 412

Jones Foundry & Machine Co., W. A.:
40th Anniversary, Jan 16 p 258
Relocated Equipment Boosts Output*, Feb 6 p 438

Jones, J. A.:
Chromium-Copper Structural Steel, May 15 p 1484

Jones, John Paul:
Wage Incentives in Manufacturing, Mar 13 p 786

Jones, Walter B.:
New Duties on Graphite, Jan 30 p 390

Jordan, J. P.:
Hiring Age Limit, Feb 6 p 453

Joseph, T. L.:
Producing Artificial Manganese Ore, Mar 6 p 723

Judge, J. D.:
Pattern Construction, Savings by Consulting Foundry*, Feb 13 p 528
Spacing in Group Patterns for Small Castings*, Jan 23 p 283

Jung, A.:
German and American Duplex Methods Compared, June 12 p 1760

K

Kaufmann, Charles F. L.:
Education and Training for Industry, Jan 9 p 170

Keeney, Robert M.:
Fuels for Heat Treating*, Jan 2 p 58; Jan 9 p 148

Kelley and Winlock:
Sheet Steel, Cause and Cure of Stretcher Strains, Feb 13 p 516

Kelley, Dr. George L.:
Value of Research to Manufacture, Jan 23 p 291

Kent Machine Co.:
Bolt and Stud Pointer*, May 22 p 1551
Double Countersinking Machine for Nuts*, June 26 p 1905

Kift, D. B.:
Wage Incentives in Manufacturing, Mar 13 p 786

Kimball, Dexter S.:
Management Engineering Problems, Mar 13 p 781

Kindt-Collins Co.:
Twin Pot Melting Unit*, May 1 p 1312

Kinite Corporation:
New Iron Alloy, Feb 27 p 664

Kingsbury Machine Tool Corporation:
Drilling Machine for Cotter Holes*, Jan 30 p 376

Kinsel, A. B.:
Effect of Chromium on Manganese-Chromium Steels, Feb 13 p 516

Kirkbride, Charles E.:
Limitations of Welding on Aircraft, Jan 23 p 297

Klein, Julius:
International Outlook in Steel, Jan 2 p 27

Koon, Sidney G.:
Jobbing Foundry of Eastern Steel Castings Co.*, Mar 20 p 853
Handling System in General Electric Foundry*, Apr 10 p 1069
Open-Hearth Development in 1929, Jan 2 p 35

Kuehnrich, P. R.:
Origin of Stainless Steel, Jan 30 p 361

L

Labor:
Allis-Chalmers Mutual Aid Society, Mar 20 p 843
American Wages and "Comforts" (Editorial), June 5 p 1703
Changes in Vocations, Jan 2 p 68
Earning Time, Shortening (Editorial), May 8 p 1408
Education and Training for Industry, Jan 9 p 170
Elastic Work Day in Delaware & Hudson Railroad Co., Apr 24 p 1237
Employees' Suggestions, Value of, Apr 17 p 1144
Employment and Payrolls in Identical Plants, November, p 272; January, February, p 1088; March, p 1432
Employment Created by Research, Feb 20 p 595
Employment, Will to Stabilize (Editorial), Apr 24 p 1244
General Electric Co.'s Unemployment Plan, June 26 p 1939
Hiring Age Limit, Feb 6 p 453
Industrial Output, April, June 12 p 1797
Man-Hour Productivity 1914-1927*, Apr 3 p 1017
Mechanization and the Worker, Mar 13 p 794
Mechanization and Unemployment (Editorial), June 26 p 1915
Mechanization Pace Aggravates Employment Problem, June 26 p 1916
Pensions, United States Steel and Carnegie Disbursements, Feb 6 p 477
Service Records in Commonwealth Division of General Steel Castings Corporation, Jan 16 p 252
Shipyard Employment Gains, June 26 p 1912
Short Work, Short Buying (Editorial), May 22 p 1561
Turnover Half of Last Year's, May 8 p 1402
Unemployment an Economic Flaw, Apr 24 p 1238
Unemployment, Appearances as to (Editorial), Apr 17 p 1178
Unemployment Marmon Company Relieves, Feb 27 p 655
Unemployment, Myth of Technological (Editorial), June 12 p 1773
Unemployment Needs Greater Study (Editorial), Apr 10 p 1098
Unemployment, Problem of, Jan 2 p 65
Wage Incentives in Manufacturing, Mar 13 p 786
Wages, Dismissal, Feb 6 p 459; May 1 p 1332
Wages Financed Through Consumption, Feb 27 p 681
Wages, Puddlers', Mar 6 p 730; June 12 p 1787
Wages, Sheet and Tin Mill, May 1 p 1358
Wages, Steel, Under 8-Hr. Day*, Apr 3 p 1008

Laboratories:
Columbia University to Have Testing, Jan 30 p 381
Ferrous Magnetic for Iron and Steel, Apr 10 p 1092
Hydraulic for Bureau of Standards, Apr 17 p 1181
Materials Testing, University of Illinois*, May 29 p 1595

Laclede Steel Co.:
Natural Gas-Fired Skelp-Heating Furnace*, May 22 p 1534
Tube Mill*, Apr 24 p 1226

Ladder:
Patent Safety Platform*, Apr 17 p 1161

Ladle:
Whiting Teapot, with Split Spout*, May 1 p 1311

Laidlaw, Inc., William:
Hydraulic Feed for Band Saws*, June 26 p 1905

Laidler, Harry W.:
Changes in Vocations, Jan 2 p 68

Lake Superior Iron Ore Association:
Iron Content of Lake Ore, 1929, Mar 27 p 976
Officers, Apr 10 p 1095
Ore Shipments, 1929, Feb 13 p 557; April, 1930, May 8 p 1428

Lalance & Grosjean Mfg. Co.:
Chrome-Nickel Alloy Utensils*, Feb 6 p 445

Lamson & Sessions Co.:
Merged with Foster Bolt & Nut Co., Jan 9 p 195

Landau Machine & Drill Press Co.:
Combination Drilling & Tapping Machine*, May 22 p 1551

Landis Machine Co.:
1-In. Forming and Threading Machine*, June 5 p 1691
Grooving Cutters for Victaulic Joints*, May 29 p 1624

Landis Tool Co.:
Hydraulic Roll Grinder*, Jan 23 p 318

Lane, H. M.:
Metallurgical Trends in Gray Iron Foundry, May 1 p 1319

Langlier Mfg. Co.:
High-Speed Duplex Drill*, May 22 p 1548
Drilling and Reaming Machine*, Apr 10 p 1084
Drilling Machine, Five-Way*, Feb 13 p 519
Swaging Machines*, Jan 23 p 316; Jan 30 p 377

Lanham, E. T.:
Teaching Heat Treating, Mar 27 p 915

Lansburgh, Richard H.:
Mechanization and the Worker, Mar 13 p 795

Lapping:
Abrasive Compound for Tungsten-Carbide Tools*, May 15 p 1477
Machines Used for, Mar 27 p 943

La Salle Machine Works:
Inclinable Press with Welded Steel Frame*, Jan 23 p 317
Presses, Straight Sided*, Feb 27 p 662

Lathes:
Acme Turret, for Tungsten-Carbide Tools*, June 26 p 1906
Barnes Automatic, with Hydraulic Feed*, May 1 p 1327
Gridley Automatic*, June 5 p 1692

(Lathes, *Continued*)
Hammond Motor-Driven Buffing and Polishing*, Mar 6 p 735
LeBlond Hydraulic Crankshaft*, Mar 6 p 731
Schauer Speed, for Polishing and Finishing*, Apr 3 p 1014

Latimer, Murray W.:
Hiring Age Limit, Feb 6 p 453

Lauck, Lee G.:
Railroad Expenditures in Next Six Years, Feb 20 p 581

Lawrence, E. S.:
Normalizing Sheet Steel, Feb 13 p 517; Feb 27 p 668

Lead:
Production, 1929, Feb 6 p 486; May 29 p 1616

LeBlond Machine Tool Co., R. K.:
Hydraulic Crankshaft Lathe*, Mar 6 p 731

Lee and Schade:
Structural Steel Heat Treated, Feb 13 p 510

Leipzig Fair:
Machine Tool Show, May 29 p 1618

Leonard Refrigerator Co.:
Making Refrigerators on Conveyors*, Mar 27 p 928

Lewisohn, Sam A.:
Unemployment an Economic Flaw, Apr 24 p 1238

Lidgerwood Mfg. Co.:
Hoist with Emergency Brakes*, Feb 27 p 660

Lincoln Electric Co.:
Arc Welded Presses and Shears*, Apr 10 p 1076
Automatic Rear Axle Housing Welder*, June 26 p 1908
Automatic Tube Welder*, Apr 3 p 1013
Carbon Arc Welding Machine*, Jan 30 p 377
Tests of Electric Welds in ½-In. Steel Plates*, May 29 p 1606
Welded Joints for Structural Frame*, Jan 16 p 222
Welding Electrode for Thin Sheet, June 5 p 1701

Lincoln, J. F.:
Economic Field of Cast Iron, May 15 p 1484
Welding Machines, Single vs. Multiple-Operator, Apr 24 p 1246

Linde Air Products Co.:
Cutting Through 5 ft. of Cast Steel*, Apr 24 p 1230

Lindeberg, Alfred:
Spontaneous Cracking of Oil-Tempered Wire, June 19 p 1848

Linden, Carl:
Billet Cleaning Machine*, Jan 30 p 367

Lindsay-McMillan Co.:
Delco Core Strength Testing Machine*, May 22 p 1551

Link-Belt Co.:
Materials Handling Equipment, Use of Different Types*, June 19 p 1810
Melting Conveyor with Vibrating Screens*, May 8 p 1392
Steel Drive Chain, Apr 10 p 1086

Linz, Paul:
Tin in Period of Adjustment, Jan 2 p 93

Liquid Metal Products, Inc.:
Metallic Liquid for Protecting Galvanizing, Apr 10 p 1088

Little, Arthur D.:
Scientific Research Needed for Steel Industry, May 15 p 1459

Little, E. H.:
Dismissal Wage, Feb 6 p 459

Living:
Still Higher Scales of (Editorial), May 29 p 1631

Loading Machine:
Coal, Oldroyd Electric*, June 19 p 1824

Locomotives:
40-In. Moves Under Own Steam*, Apr 3 p 996
Shipments, December, p 249; January, p 526; February, March, p 1174; April, p 1506; May, p 1770

Loree, L. F.:
Elastic Work Day in Delaware & Hudson Railroad Co., Apr 24 p 1237

Lubricating Device:
Hills-McCanna Co.*, Apr 17 p 1162

Lubrication:
Steel Plant Problems, May 15 p 1455

Ludlow-Saylor Wire Co.:
Wire Cloth*, Jan 16 p 238

Ludlum Steel Co.:
Annual Report, Apr 10 p 1134

Lukens Steel Co.:
To Engage in Welded Construction, June 19 p 1840

Luxemburg:
Steel Output, 1929, Mar 27 p 976

M

MacDonald Brothers Engineering Laboratories:
To Honor Industralists with Gold Medals, Jan 30 p 410

Machinability:
Malleable Castings, May 22 p 1532

Machine Age:
Readjustments of, Mar 13 p 794

Machine Shops:
Baldwin Frame and Cylinder*, Mar 27 p 921

Machine Tool Industry:
Irregular Demand and Employment, May 29 p 1617
New Census Schedule, Feb 13 p 522
Plant Capacity Studies*, May 29 p 1617

Machine Tools:
Appraisal of Present Situation, Jan 2 p 62
Definition of, May 29 p 1619
Forecast of Demand*, Jan 16 p 245
Instalment Sales, June 12 p 1775
Outlook, Jan 2 p 45
Survey of Buyers, Apr 3 p 990

Machinery:
American Automatic Not New, June 19 p 1844
Export Record, 1929, May 22 p 1589
Exports and Imports by Months, November, p 207; December, p 419; January, p 769; February, p 1051; March, p 1439; April, p 1729
Exports of Industrial, 1922-1929*, p 595; January, p 870; Year 1929, p 1269*; Four Months, p 1724
Exports of Oil Well and Refinery, 1929, June 19 p 1870
Industrial, Indian Imports, Apr 3 p 1050
Industry Lacks Organization (Editorial), Jan 2 p 107
Replacing Depreciated, Jan 2 p 72

Machinery Builders Society:
Adopts Resolution on Firm Bidding, May 22 p 1552

Machinery Conference:
Federation of Machinery Industries Proposed, Feb 6 p 455

Machining:
Hubs for Wire Wheels*, Feb 20 p 571

MacKenzie, James T.:
Carbon and Sulphur in Cupola—Some Properties of Coke, June 5 p 1680

Macon, W. W.:
Editor-in-Chief of THE IRON AGE*, Apr 17 p 1149

Madison-Kipp Corporation:
Pneumatic Grinder for Die Work*, Feb 6 p 447

Mahon Co., R. C.:
Fabricating and Handling Equipment*, Jan 9 p 151

Maizolith:
New Industrial Material, May 15 p 1501

Management:
Affected by Plant Growth, Jan 2 p 75
Armco Foreman - Manager Plan*, Mar 13 p 777, (Editorial) p 814
Burden on Next Decade, May 8 p 1388
Cost Data for Workman, June 26 p 1879
Engineering, Problems Ahead, Mar 13 p 781
Foreman Key Man in Organization, June 26 p 1877
In Foundry Operations, May 29 p 1605
Industrial, Developments in, Apr 10 p 1082
Market, Trends in, Jan 2 p 70
Scientific, in Japan, Jan 23 p 298
Ten Commandments of, May 22 p 1545
Time for the Question Mark (Editorial), June 12 p 1772
Unit Costs Reduced by Planning, June 12 p 1768
Utilization of Materials, May 8 p 1388

Manganese:
Great Bulk Goes Into Steel, June 12 p 1740

Manufacture:
Changes in Iron and Steel, May 15 p 1505
Value of Research to, Jan 23 p 291

Manufactures:
(See Census of Manufactures)

Marketing:
Commercial Man Is in the Saddle (Editorial), May 1 p 1338
Industrial, in New Era, May 29 p 1629

Markets:
Closing, in Consumer Goods*, June 26 p 1891
Trends in Management, Jan 2 p 70

Marking Machine:
Noble & Westbrook Production*, Jan 30 p 378

Marmon Motor Car Co.:
Relieves Unemployment, Feb 27 p 655

Mars, G.:
Alumina, Effect on Slags in Steel Melting Furnaces, Mar 20 p 845

Marshall, W. B.:
Material Handling in Small Foundry, Feb 20 p 586

Martensite:
Study of Grain Structure, Feb 13 p 516

Mass Production:
Closed Markets Limit*, Jan 2 p 82

Material and Equipment Inspection Bureau:
Organized, May 8 p 1389

Materials Handling:
(See also Conveyors)
Advantages of, May 15 p 1501
At Blast Furnaces, Mar 6 p 737
Conveyor System in Dayton Pump & Mfg. Plant*, Jan 23 p 300
In Baldwin Locomotive Works*, May 22 p 1517
In California Forests*, Mar 27 p 927
In Chicago *Daily News* Plant, Mar 13 p 795
In General Electric Pittsfield Foundry*, Apr 10 p 1069
In Ohio Brass Plant*, Feb 20 p 567
In R. C. Mahon Plant*, Jan 9 p 151
In Small Foundry, Feb 20 p 586
Progress, Jan 2 p 48
Scrap Conveyors in Motor Wheel Plant*, Feb 27 p 631
Scrap in Waukesha Plant*, Mar 13 p 796
Use of Different Types of Equipment*, June 19 p 1810

Mathur, N.:
Making Steel from Indian Pig Iron, Mar 20 p 845

Mayme, B. R.:
Continuous Melting Process as Applied to Malleable Iron, May 22 p 1532

McAllister, A. S.:
Buying Under Rigid Specifications, Feb 6 p 452

McClintic-Marshall Co.:
Merged with Riter-Conley Co., Jan 9 p 191

McKee, Arthur G.:
Blast Furnace Developments*, Jan 2 p 37

McKee & Co., Arthur G.:
Contract for Russian Steel Plant, Mar 20 p 890
Enters General Industrial Building Field, Feb 13 p 559

McKnight, Charles:
Nickel Alloy Steel Forgings, Feb 13 p 515; Mar 20 p 851
Use of Nickel as an Alloy*, May 22 p 1539

McWane Cast Iron Pipe Co.:
Acquires Utah Plant, Feb 6 p 476

Mechanization:
Pace Aggravates Employment Problem, June 26 p 1916
Unemployment and (Editorial), June 26 p 1915
Worker and, Mar 13 p 794

Meisse and Graham:
Deep-Etch Test of Brass, June 12 p 1745

Mellon Institute:
To Have New Research Building, June 5 p 1690

Mercury Mfg. Co.:
Trailer for Hot Strips and Plates, Mar 20 p 869

Mergers:
Bethlehem Steel Corporation and Youngstown Sheet & Tube Co.*, Mar 20 pp 876, 897, (Editorial) p 882; Mar 27 p 948; Apr 3 p 1023; Ratified, Apr 17 p 1165; Suit to Block, May 1 p 1333; May 8 p 1429
Blower Manufacturers, Feb 6 p 476
Cleveland-Cliffs Iron Co. and Oglebay, Norton & Co., June 5 p 1697
Duquesne Steel Foundry, Wheeling Mold & Foundry and Hubbard Steel Foundry Companies, May 22 p 1581
General Refractories and Evens & Howard Fire Brick Companies, Jan 23 p 325
In 1929, Jan 2 p 88
Lamson & Sessions and Foster Bolt & Nut Companies, Jan 9 p 195
McClintic-Marshall and Riter-Conley Companies, Jan 9 p 191
Pittsburgh Forgings and Greenville Steel Car Companies, Jan 30 p 384
Pullman, Inc., Standard Steel Car and Osgood Bradley Car Companies, Jan 2 p 108
Republic Steel Corporation, Other Independents Expected to Join, Jan 9 p 172
Scovil Mfg. Co. and Schrader's Sons, Inc., Jan 9 p 198
Sivyer and Nugent Steel Casting Companies, Feb 20 p 613
Spang, Chalfant & Co. and National Supply Co., June 26 p 1910
William Swindell & Brothers, American Dressler Tunnel Kilns, Gas Combustion and Duquesne Burner Service Companies, June 19 p 1832

Meriam Co.:
Cushioning Device for Gages*, Apr 10 p 1085

Merten, William J.:
Softening Nitrided Steels by Chemical Decomposition, Feb 13 p 516

Metallurgy:
Iron, Progress in, Mar 20 p 862

Metals:
Artistry in*, May 29 p 1591
Bearing, Developments, Mar 6 p 722
Early Uses of, June 5 p 1672
Non-Ferrous (Editorial), Mar 6 p 740
Non-Ferrous, Advances in, Jan 2 p 55
Progress in Brass and Bronze, June 12 p 1745
Secondary (Editorial), Apr 10 p 1098

Metric System:
Limited Vogue of, Mar 6 p 743
Music and, Mar 13 p 814
Subdivision of Units, Apr 3 p 1028
Substitution Expensive, Feb 20 p 595; Feb 27 p 668; Mar 20 p 885

Meyer, Dr. Harry:
Personnel Management, May 29 p 1605

Michigan Steel Casting Co.:
Wearing Strips for Guides*, Apr 10 p 1085

Micrometer:
Brown & Sharpe No. 24*, Feb 13 p 521

Micromotion Study:
Applied to Manufacture of Small Parts, Apr 24 p 1240

Midwest Steel Corporation:
Organized by National Steel Corporation, June 5 p 1698

Midvale Co.:
Forging, Record Size*, Feb 13 p 518

Miller, Joseph R.:
Deoxidation in Steel Making, Apr 24 p 1223

Miller, Lee H.:
Steel for House Construction, May 29 p 1609

Miller, R. E.:
Production Control in Building Large Machines*, Apr 3 p 997

Miller, R. W.:
Grünewald Process of Bright Annealing*, Apr 3 p 1002

Milling Machines:
Brown & Sharpe Redesigned Plain*, Feb 6 p 451
Cincinnati Planer-Tvpe*, Jan 30 p 378
Consolidated Boring, Drilling and*, Feb 20 p 593
Reed-Prentice Die Sinking and*, Feb 27 p 661
Stamets Automatic Spline*, Mar 27 p 945

Milne & Co., A.:
Swedelec, New Magnetic Steel, Feb 6 p 474

Milwaukee Electric Crane & Hoist Corporation:
Monorail Hoist*, May 8 p 1393

Minerals:
Production, 1929, Feb 13 p 553

Modern Pouring Device Co.:
Electrical Pouring Unit*, May 8 p 1392
New Ladle Pouring Device*, Feb 27 p 660

Modern Tool Works:
14-In. Stationary Self-Opening Die Head*, May 15 p 1477

Moffett, L. W.
Farmer Buying Power Increases, Jan 2 p 30

Moldenke, Dr. Richard:
Long Life Molds, May 1 p 1292
Trend in Gray Iron, Jan 2 p 36

Molding Machines:
Herman Rollover and Stripper*, May 1 p 1302
Johnston & Jennings Jolt Rollover*, May 1 p 1312
Nicholls Jolt Squeeze*, May 1 p 1300
Osborn Jolt Squeeze and Rollover*, May 1 p 1308
Tabor Hand Rollover*, May 15 p 1474

Molds:
Green Sand for Steel Castings, Mar 6 p 711
Long Life and Their Uses, May 1 p 1292
Wash, for Use When Die Casting Brass, May 8 p 1376

Molybdenum:
In Cast Iron, Jan 16 p 252

Molybdenum Corporation of America:
Acquires York Metal & Alloy Co., Apr 3 p 1029

Molybdenum Ore:
(See Ore)

Molybdenum Steel:
Survey of Applications*, Jan 9 p 141

Monel Metal:
In Foundry Practice, June 12 p 1754
New Finish, June 26 p 1942
Used in Construction of Cleveland Terminal, Mar 20 p 878

Monorail:
American*, May 1 p 1309

Moore, H. F.:
Materials Testing Laboratory of University of Illinois*, May 29 p 1594
Progress in Tests for Automobile Materials, May 1 p 1334

Morris, Alan:
Season Cracking of Brass*, Mar 27 p 932

Morse Twist Drill & Machine Co.:
Cobalt Steel Drills, Jan 9 p 160
Morton Mfg. Co.:
Draw-Cut Shaper*, June 12 p 1761
Drive Units*, Jan 9 p 161
Shaper Attachment for Splining Hubs*, Feb 27 p 661
Mosehauer, Edward:
Outlook for Copper, Jan 2 p 92
Mossberg, Frank:
In Favor of Metric System, Feb 27 p 668
Motion Pictures:
Continuous Sheet Rolling, May 8 p 1391
Materials Handling in Chicago *Daily News* Plant, Mar 13 p 795
Monel Metal, Feb 13 p 559
Motor Transport:
Trends (Editorial), Feb 13 p 531
Motor Wheel Corporation:
Scrap Conveyor System*, Feb 27 p 631
Motors:
Century Fan-Cooled Induction*, Mar 20 p 869
Cleveland Semi-Inclosed*, Apr 10 p 1085
Westinghouse High-Speed Induction*, Feb 13 p 521
Mounts:
Stone, for Loose or Gated Patterns*, May 8 p 1393
Murray Corporation:
Automobile Body Manufacture*, Feb 6 p 427
Museums:
Field, Iron Workers of Tinguian Tribe*, June 26 p 1890
Industrial, Engineering Advisers for, Apr 3 p 1020
National Engineering and Industry Planned, June 26 p 1942
Mutual Aid Society:
In Allis-Chalmers Plant, Mar 20 p 843

N

Nash Motors Co.:
Kenosha Foundry Production Units*, Apr 17 p 1138
National Acme Co.:
Die Heads with Removable Circular Chasers*, June 5 p 1693
Four-Spindle Gridley Automatic*, June 5 p 1692
National Association of Flat Rolled Steel Manufacturers:
Annual Meeting*, June 26 p 1899
Production and Other Statistics, December, p 337; January, p 664; February, p 902; March, p 1276; April, p 1629; May, p 1938
National Association of Purchasing Agents:
Coal, Industrial Stocks, Jan 9 p 206; Mar 20 p 870; Apr 10 p 1123; June 12 p 1789
Convention Proceedings, June 26 p 1909
National Association of Sheet Metal Distributers:
Organized, May 22 p 1557
National Association of Waste Material Dealers:
Annual Meeting, Mar 27 p 965
National Bronze & Aluminum Foundry Co.:
New Aluminum Melting Furnace, Mar 20 p 879
National Business Survey Conference:
Credit Resuming Flow to Normal Channels, Feb 13 p 560
To Organize Permanent Construction Committee, Jan 30 p 382
National Die and Special Tool Builders Association:
Officers, Feb 6 p 446
National Engineering Inspection Association:
Organized, May 1 p 1334
National Hardware Association:
Metal Branch Reorganized as National Association of Sheet Metal Distributers, May 22 p 1557
National Industrial Conference Board:
Analysis of World Energy Production, 1913-1928, Mar 13 p 806
Annual Meeting, May 22 p 1563
Business in Waiting Attitude, Mar 27 p 940
National Machine Tool Builders' Association:
Conference on Cost Methods, May 1 p 1322
Forecast of Machine Tool Demand* Jan 16 p 245
Spring Convention Proceeding, May 29 p 1617
National Malleable & Castings Co.:
Cast Steel Anchor Chain*, Feb 6 p 434
National Metal Trades Association:
Convention Proceedings, Apr 24 p 1228
National Museum of Engineering and Industry:
Plan for Government, June 26 p 1942
National Steel Corporation:
Organizes Midwest Steel Corporation, June 5 p 1698
Plans Works at Gary, Ind., Jan 16 p 245
To Build Rail Mill at Weirton, Feb 6 p 469
National Supply Co.:
Merged with Spang, Chalfant & Co., June 26 p 1910
National Tool Co.:
Gear Grinding and Testing Equipment*, Mar 6 p 732
National Western Metal Congress:
1931 Convention Announcement, Mar 27 p 977
Nazel Engineering & Machine Works:
Heavy-Duty Air Hammer*, Mar 13 p 800
Nealey, J. B.:
Conveyor System in Dura Plant*, Apr 10 p 1061
Nelson, T. Holland:
Alloys That Resist Heat*, Feb 6 p 431; Feb 20 p 578
Status of Stainless Steel, Jan 2 p 84
Neuhauss, H.:
Comparison of High-Frequency and Arc Electric Furnaces, Apr 17 p 1180
News:
Reporting (Editorial), Apr 10 p 1099
Newton Steel Co.:
Annual Report, Feb 6 p 478; Apr 10 p 1133
Making Electrical Sheets, May 29 p 1616
New Michigan Sheet Mill*, Apr 10 p 1064
Niagara Machine & Tool Works:
Throat Machine*, Mar 20 p 869
Nichols, W. W.:
Firm Bidding, May 22 p 1552
Nicholls Co., William H.:
Molding Machines*, May 1 p 1300
Nickel:
Consumption, Relation Between Output of Alloy Steel and*, May 22 p 1527
Foundry Practice, June 12 p 1754
Industrial Uses, Apr 10 p 1087
Romance of (Editorial), Mar 20 p 883
Use as an Alloy*, May 22 p 1525; May 29 p 1600
World Production 1850-1930*, May 22 p 1526
Nitriding:
Large Forgings*, Mar 13 p 787
Present and Future of, Jan 2 p 52
Process for De-Nitriding Steels Possible, Feb 13 p 516
Noble & Westbrook Mfg. Co.:
Production Marking Machine*, Jan 30 p 378
Non-Ferrous Ingot Metal Institute:
Annual Meeting, May 8 p 1396
Norris, Major G. L.:
Vanadium Steels for Railroad Equipment, Jan 23 p 297
Norskalloy:
Electric Pig Iron, Feb 13 p 508
Northern Engineering Works:
Crane Trolley with Aluminum Parts*, May 1 p 1307
Norton Co.:
Roll Grinding Machine*, May 29 p 1624
Nugent Steel Castings Co.:
Acquired by Sivyer Steel Casting Co., Feb 20 p 613
Nuts:
Columbian Recessed to Stop Tank Leakage*, May 1 p 1331

O

Obituary:
Abbot, William L., May 8 p 1406
Adams, Asael E., Jan 9 p 193
Affelder, Louis*, Apr 17 p 1177
Ainsworth, Harry*, Feb 20 p 620
Alford, Walter H., Feb 13 p 555
Ams, Charles M., May 29 p 1628
Anderson, Charles A., Apr 10 p 1094
Arnold, John O., F.R.S., Apr 10 p 1095
Arthur, James, May 15 p 1486
Baker, William H., Feb 20 p 620
Baldridge, William H., Mar 13 p 832
Barrows, Oliver R., Mar 6 p 766
Bellows, Charles F., Feb 27 p 688
Black, William, May 1 p 1337
Bond, Henry R., Jr., Jan 23 p 346
Booth, Henry D., June 5 p 1701
Boucher, James H., May 8 p 1406
Boutwell, Roland H., May 22 p 1558
Bradbury, Frank H., Mar 20 p 904
Bragdon, Joseph H., Feb 27 p 688
Brigham, Henry H., Jan 9 p 193
Brittingham, Frank J., Feb 6 p 481
Brotherhood, Alfred, Apr 17 p 1177
Brown, Louis, May 8 p 1406
Bullard, A. H.*, Apr 10 p 1095
Burrell, Ernest L., Jan 23 p 346
Campbell, E. D., Feb 27 p 688
Campbell, James J.*, Mar 20 p 904
Charles, John E., May 22 p 1558
Chickering, Howard E., Jan 30 p 412
Child, Edward T., June 12 p 1770
Clarkson, Coker F., June 12 p 1770
Clemson, George N., Feb 20 p 620
Coleman, Adelbert E., Feb 20 p 620
Costello, William F., Feb 13 p 555
Cowan, James D., Mar 27 p 974
Cox, Jacob D.*, Feb 27 p 688
Crowther, J. S., June 19 p 1845
Cullinan, Daniel J., Mar 13 p 832
Curtis, L. E., Jan 23 p 346
Cushman, Dr. Allerton S., May 8 p 1406
Davie, George F., Apr 10 p 1095; Apr 17 p 1177*
Decker, Ernest F., May 29 p 1628
Disston, Henry, Mar 27 p 974
Dixon, Henry L., May 8 p 1406
Douglass, William A., May 1 p 1337
Dowling, Martin J., Jan 23 p 346
Drever, Elizabeth, Feb 13 p 555
DuPuy, Herbert, Jan 17 p 274
Dutcher, Frank J., Apr 17 p 1177
Eurich, Ernest F., Apr 3 p 1025
Evans, Charles W., Mar 13 p 832

(Obituary, *continued*)
Falk, Nils, May 1 p 1337
Feltes, Louis J., Feb 27 p 688
Freet, W. H., May 8 p 1406
Geer, Lynford E., May 29 p 1628
Gerlinger, George P., May 22 p 1558
Grant, William D., Jan 9 p 193
Green, E. D., June 5 p 1701
Greenbaum, Alexander L., June 26 p 1913
Griffiths, Edwin S., Feb 6 p 481
Groome, James P., June 12 p 1770
Guppy, Frank H., Feb 6 p 481
Hall, Charles B., Jan 9 p 193
Hall, Gilbert N., June 19 p 1845
Hall, John, Jan 30 p 412
Hammond, H. D.*, Mar 6 p 766
Hannan, George W., May 22 p 1558
Harper, Joseph D., Apr 10 p 1095
Harvey, Douglas G., June 26 p 1913
Herschel, Clemens, Mar 6 p 766
Hess, Winter D., Mar 13 p 832
Hinrichs, William, Mar 13 p 832
Hirsch, William L., Feb 13 p 555
Hodges, Clarence W., Jan 23 p 346
Holmes, Carroll O.*, May 22 p 1558
Honstain, George T., Feb 6 p 481
Hurd, J. V., May 15 p 1480
Huston, Abram F.*, Jan 16 p 274
Hyde, E. R.*, Apr 10 p 1094
Hyndman, Nathan P.*, Mar 13 p 832
Jacoby, William L., Jan 16 p 274
Jernberg, Carl, May 29 p 1628
Johnson, Eric H., Apr 17 p 1177
Jones, Frederick T., May 15 p 1480
Jones, George W.*, Apr 24 p 1243
Kamschulte, Otto P., June 12 p 1770
Keller, Sidney A., June 19 p 1845
Kimball, Fred M., Feb 13 p 555
King, Warren P.*, Feb 6 p 481
Krause, Ernst, Apr 17 p 1177
Landon, Archer A., Jan 9 p 193
Larmon, Arthur J., Jan 9 p 193
Lavino, E. J., Mar 6 p 766
Levedahl, Alex, Mar 6 p 766
Lewis, Wilfred*, Jan 9 p 193
Loesch, Albert P., Feb 6 p 481
Logan, Edward P., May 15 p 1480
Long, George J., Jan 23 p 346
Longmore, William J., Mar 13 p 832
Luitink, John P., June 26 p 1913
Mannaberg, Maximilian, Jan 9 p 193
March, Perrin G., Mar 6 p 766
Marquardt, Carl, May 8 p 1406
McAvoy, Ford, June 5 p 1701
McCleary, Elmer T.*, Apr 24 p 1243
McCrae, James V., Mar 20 p 904
McDaniel, C. E., May 8 p 1406
McGraw, Fred V., Apr 24 p 1243
McKee, Walter S., May 29 p 1628
Mentall, Albert, June 12 p 1770
Merryweather, George E.*, June 12 p 1770
Millett, Charles H., May 22 p 1558
Miner, William H., Apr 10 p 1094
Mitchell, John H., Jan 23 p 346
Monroe, Harry L., Jan 16 p 274
Moore, Eugene M., Apr 3 p 1025
Moore, Philip N., Jan 30 p 412
Moore, Roswell A., June 12 p 1770
Morgan, Alexander D., May 1 p 1337
Mouch, Charles W., June 5 p 1701
Murphy, John A., Jan 23 p 346
Myers, Henry B., Mar 20 p 904
Newcomb, Charles L.*, Mar 20 p 904
Nickerson, William E., June 12 p 1770
North, H. P., Feb 6 p 481
Olle, John, Feb 6 p 481
Peckham, J. H., Jan 30 p 412
Pennock, C. A., Feb 13 p 555
Phillipson, Brainerd F., Apr 10 p 1095; Apr 17 p 1177*
Poppenhusen, Paul A., May 29 p 1628
Pratt, Francis C., Feb 6 p 481
Priest, Albert W., Feb 20 p 620
Rateau, Auguste C. E., Feb 13 p 555
Reed, Edgar, May 29 p 1628
Reid, William A., June 12 p 1770
Reid, William H., Jan 9 p 193
Reitz, William C.*, May 8 p 1406
Richards, Thomas M., Jan 16 p 274
Robertson, William, May 8 p 1406
Sanderson, Edward P., Apr 10 p 1094
Satterlee, Frank E., June 12 p 1770
Scaife, James V., Apr 10 p 1095
Scholtka, Christian, Apr 24 p 1243
Schonthal, Joseph, Jan 9 p 193
Seabrook, Harry H., Apr 24 p 1243
Seeboth, Albert M., Jan 30 p 412
Senior, Albert, Jan 9 p 193
Seyler, Carl P., May 15 p 1480
Shaw, George W., Apr 10 p 1094
Shepard, George B., May 8 p 1406
Sowersby, P. L., Feb 6 p 481
Spencer, Albert K., May 29 p 1628
Sperry, Elmer A.*, June 19 p 1845
Stambaugh, John H, June 19 p 1845
Starbuck, A. E., Apr 24 p 1243
Story, Benjamin S., Jan 9 p 193
Sullivan, James F., Mar 20 p 904
Sweet, John E., May 1 p 1337
Taylor, William D., Apr 3 p 1025
Thompson, David P., Mar 27 p 974; Apr 3 p 1025*
Treat, Francis H., Jan 23 p 346
Truax, Frank H., June 5 p 1701
Tscherning, Henry, June 19 p 1845
Turn, Charles R., Apr 17 p 1177
Veatch, Byron E., Jan 30 p 412
Wade, Charles G., Jan 30 p 412
Wagner, Carlton S., Feb 13 p 555
Wanning, F. D.*, Apr 24 p 1243
Watling, John B., Mar 20 p 904
Weinhagen, Frederick, Apr 10 p 1095
West, Harry J., May 22 p 1558
Whitney, George F., Apr 24 p 1243
Whittemore, Edward L.*, Feb 6 p 481
Wolfe, Merritt L., June 19 p 1845
Young, Charles E.*, May 1 p 1337
Zannoth, Robert C., Feb 6 p 481

Oglebay, Norton & Co.:
Merged with Cleveland-Cliffs Iron Co., June 5 p 1697
Win Mine Safety Award, June 12 p 1795

Ohio Brass Co.:
Mechanizing Foundry Brings Savings*, Feb 20 p 567

Ohio Foundries Association, Inc.:
Uniform Cost Methods Stressed at Sectional Meeting, June 26 p 1883
Sectional Meeting on Material Handling and Non-Ferrous Foundry Practice, Feb 20 p 586

Ohio Machine Tool Co.:
Super-Dreadnaught Shaper*, June 19 p 1838

Ohio Steel Foundry Co.:
Manufacture of Rustless Steel Castings*, Apr 3 p 993

Oldroyd Machine Co.:
Electric Coal Loading Machine*, June 19 p 1824

Olds, Marshall:
Steel Wages Under 8-Hr. Day*, Apr 3 p 1008

Ontario Metal Industries Reasearch Association:
Organized, Jan 16 p 249

Open-Hearth Operators:
Semi-Annual Meeting Proceedings, May 29 p 1601; June 5 p 1669; June 12 p 1758

Ore, Brazilian:
Sponge Iron from*, May 1 p 1298

Ore, Iron:
Deposits Found at Lakeland, England, Mar 6 p 739
Deposits in Finland, May 1 p 1337
Imports and Countries of Origin, November, p 191; December, p 486; January, p 870: February, p 1123; March, p 1410; April, p 1797
Lake Superior. Stocks at Lake Erie Ports, 1929, p 623; On April 1, 1930, p 1173
Lake Superior, Iron Content, 1929, Mar 27 p 976
Lake Superior Shipments, 1929, p 557; April, 1930, p 1428; May, p 1854
Lean. Smelting for Manganese, Feb 20 p 570
Newfoundland Hematite Production, 1929, Feb 20 p 597
Production and Value, 1929, Jan 16 p 283
Sintering Limonitic*, Feb 27 p 642
Sources and Distribution, 1929, May 8 p 1433

Ore, Manganese:
Foreign Activities in, Apr 3 p 1001
French Imports (Editorial), May 1 p 1338
High-Grade by Flotation, Feb 27 p 669
Imports and Production, 1929, Jan 23 p 349; June 5 p 1701
International Corporation to Handle Turkish, Feb 20 p 617
Producing Artificial, Mar 6 p 723
Russian Exports, Jan 9 p 204

Ore, Molybdenum:
Output 1929, May 8 p 1396

Osborn Mfg. Co.:
Jolt Squeeze Stripper and Rollover Molding Machines*, May 1 p 1308

Oster Mfg. Co.:
Bench Type Power Threader*, May 29 p 1620

Otis Steel Co.:
Board of Directors, Apr 3 p 1020
Plant Improvements and Expansion, Apr 10 p 1096; June 5 p 1722

Ovens:
Foundry Vertical Conveyor Type*, May 1 p 1312
Japanning, In Dura Plant*, Apr 10 p 1061

Owens, James W.:
Efficiency of Multiple-Operator Welding Generators, Mar 13 p 793
Welding Machines, Single vs. Multiple-Operator, Apr 24 p 1247

Oxide:
In Liquid Steel, Determining*, May 8 p 1386

Oxweld Acetylene Co.:
General Purpose Blowpipe*, Mar 13 p 802
Laboratory Burner, Mar 6 p 735
Oxygen Regulator, Two-Stage, Jan 16 p 238

Oxygen Lance:
Cutting 5-ft. Steel Casting*, Apr 24 p 1230

P

Paasche Airbrush Co.:
Airbrush for Applying One or More Colors*, May 15 p 1475

Pacher, F.:
Casting Steel Ingots, Mar 27 p 920

Pacific Coast Drop Forge Corporation:
Organized, Jan 16 p 243

Pacific Coast Steel Corporation:
Organized by Bethlehem Steel Corporation, Jan 30 p 384

Pacific States Cast Iron Pipe Co.:
Acquired by McWane Cast Iron Pipe Co., Feb 6 p 477

Pack, Charles:
Advances in Automobile Die Castings*, Mar 27 p 931

Packard Motor Car Co.:
Diesel Engine for Aircraft, May 1 p 1336

Packing:
For Export, May 15 p 1461

Paint:
Aluminum, Ultra Fuzon, Mar 6 p 724
Technical Products Co. Color-Bestos, May 8 p 1398

Palmer-Bee Co.:
Conveyors for Core Ovens*, June 5 p 1673
Suspended Conveyors for Foundry*, May 1 p 1299

Parish Pressed Steel Co.:
Manufacture of Alloy Steel Truck Frames*, Jan 16 p 226

Parmiter, Owen K.:
Carbide Tools, Properties and Uses of*, Mar 20 p 863
Tungsten-Carbide Cutting Tools, May 22 p 1556

Patent Scaffolding Co.:
Safety Platform Ladder*, Apr 17 p 1161

Patten, J. C.:
Aluminite Coating, Mar 20 p 868

Patterns:
Construction, Savings by Consulting Foundry*, Feb 13 p 528
Group, Spacing for Small Castings, Jan 23 p 293

Patterson Foundry & Machine Co.:
Mechanical Training Courses, May 1 p 1332

Paulson, William E.:
Overcoming Alloy Ingot Troubles in Brass Foundry, June 12 p 1745

Pearce, J. G.:
Correlation of Tests for Cast Iron, June 5 p 1679

Peck, Stow & Wilcox Co.:
Sheet - Metal Working Machine*, June 19 p 1837

Pendred, Loughnan St. L.:
What the Engineer Has Yet to Do, May 8 p 1379

Pennsylvania Fabrication Co.:
Acquired by Ingalls Iron Works, Apr 17 p 1198

Pensions:
Carnegie and United States Steel Disbursements, Feb 6 p 477

Perin, Charles P.:
Progress in Iron Metallurgy, Mar 20 p 862

Philfuels Co.:
Butane for Industrial Heating, May 15 p 1478

Phillips, C. B.:
Gas Furnaces for Annealing Castings*, Feb 27 p 637
Screw Manufacture in Elco Plant*, May 8 p 1377

Phillips, William Q.:
Music and Metric System, Mar 13 p 814

Phoenix Iron Co.:
75th Anniversary, May 8 p 1411

Phoenix Mfg. Co.:
Buys Graver Corporation, May 15 p 1481

Phos-Copper Alloy:
For Welding and Brazing, June 12 p 1763

Photo-Electric Relay:
General Electric, for Controlling Light*, May 1 p 1328

Pickling:
Brass, Metal for Containers, Mar 27 p 917

Pig Iron:
Capacity, 1929, May 8 p 1418
Correlation of Output with Diameter, June 12 p 1740
Imports and Countries of Origin, November, p 195; December, p 416; January, p 737; February, p 1082; March, p 1428; April, p 1699
Indian, Making Steel from, Mar 20 p 845
Norskalloy Electric, Feb 13 p 508
Production by Months, December, p 174; January, p 460; February, p 744; March, pp 1023, 1102; April, p 1412; May, p 1706
Production, United States, 1929, Apr 3 p 1022; World, Jan 2 p 81
Tariff Agreed Upon, Apr 10 p 1096

Piling:
H-Sections to Support Buildings on Made Ground, Feb 6 p 437

Piling Apparatus:
Wean for Tin Plate Sheets*, Mar 13 p 799; Apr 3 p 1019

Pipe:
(See also Tubes)
Cast Iron Production, 1929, Jan 9 p 154
Cast Iron, Small Diameters for Plumbing and Heating*, May 29 p 1620
Electric Welded, Youngstown Sheet & Tube to Install Unit for, June 19 p 1834
Service, for Welding Gases*, Feb 20 p 575
Steel, Welded Line Joints*, Feb 6 p 435
Wrought Iron, Reading Company Increases Sizes, June 12 p 1792

Pipe Threading and Cutting Machine:
Saunders*, May 1 p 1331

Plate Trimmer:
Sellers Large Double*, May 1 p 1323

Player, Sidney:
Mechanical Lapping, Mar 27 p 943

Plowman, E. Grosvenor:
Hiring Age Limit, Feb 6 p 454

P. M. G. Metal:
New Copper Alloy*, Mar 6 p 727

Pointer:
Kent Bolt and Stud*, May 22 p 1551

Polishing Machine:
Cincinnati Metallographic*, Jan 9 p 159
Hammond Motor - Driven Buffing and*, Mar 6 p 735

Polishing Wheel:
C. B. Hunt & Son*, Apr 17 p 1163

Porter-Cable Machine Co.:
Abrasive Sander with High-Frequency Motor*, Feb 27 p 662
Table Attachment for Saws*, May 1 p 1331

Portevin, Albert:
Theory and Practice of Corrosion Resistant Equipment, Jan 23 p 306

Potter, O. W.:
Cast Iron Refuses to Step Aside, May 1 p 1281; June 5 p 1704

Pottstown-Sotter Tank Works:
Organized, June 26 p 1933

Pouring:
Practice in Open-Hearth Furnaces, May 29 p 1603

Pouring Device:
Cleveland Overhead*, May 1 p 1306
Modern, Ladle*, Feb 27 p 660; May 8 p 1392

Power:
Analysis of World Energy Production, 1913-1928, Mar 13 p 806
And Coal, World's (Editorial), May 1 p 1340
Fuel and Water (Editorial), Mar 6 p 742
Electric, Industrial Consumption, November, p 272; January, p 664; February, p 977; March, p 1243; April, p 1725; May, p 1832
Electric Production by Public Utilities, January, p 526; February, p 1080; March, p 1410; April, p 1868
Machines Run from Unusual Overhead Circuit*, Feb 27 p 659
Water versus Fuel for Chemical Industries, June 12 p 1752

Pratt & Whitney Co.:
Acquires Garrison Gear Grinder*, June 19 p 1838
Apprentice Training, Apr 24 p 1209

Prentiss, F. L.:
Gasoline Pump Manufacture in Ferro Machine & Foundry Plant*, June 19 p 1805
Manufacture of Bumpers at Eaton Plant*, Apr 24 p 1217
Mechanizing Foundry of Ohio Brass Co.*, Feb 20 p 567
Motor Car Outlook, Jan 2 p 16

Pressed & Welded Steel Products Co.:
Stainless Steel Products*, June 12 p 1735

Pressed Metal:
Progress in*, Jan 2 p 40

Presses:
Arc Welded*, Apr 10 p 1076
Bliss, Double Crank*, May 29 p 1623; Double Eccentric*, Apr 3 p 1013
Federal 75-Ton Capacity Inclinable*, June 19 p 1837
Galland - Henning Hydraulic Scrap Baling*, Mar 6 p 729
LaSalle Inclinable, Jan 23 p 317; Straight Sided*, Feb 27 p 652
Simplex Utility*, Jan 30 p 377; Feb 13 p 520
Toledo 800,000-Lb. Crank*, Mar 27 p 945
Tomkins-Johnson Air-Operated Arbor*, June 12 p 1762
Zeh & Hahnemann No. 25 Percussion Power*, June 12 p 1763

Pressure Vessels:
Welded, British View on, Apr 17 p 1143

Price, W. B.:
Season Cracking of Brass*, Mar 27 p 932

Prices:
Cap Screws, Feb 6 p 476
Commodities, Declines Incoherent (Editorial), May 22 p 1561
Commodity, Wholesale, November*, p 83; December, p 349; January, p 695; February, p 976; March, p 1276; April, p 1582; May, p 1938
Farm and Other Products (Editorial), Jan 9 p 169
Scrap (Editorial), Mar 27 p 951
Scrap, Composite, with Comparisons, 1929*, Jan 2 p 87; First Quarter 1930*, Apr 3 p 1019
Scrap, Steel, Why Has It Declined? (Editorial), June 5 p 1702
Slashes and Business Recovery (Editorial), Jan 9 p 168
Steel, and Profits (Editorial), May 22 p 1562
Tin Plate, Lower Asked, Jan 23 p 312

Production:
Better Control of, Mar 13 p 794
Forecast of Industrial*, Jan 2 p 69
Industrial, January, p 664; February, p 977; March, p 1243; April, pp 1725, 1797; May, p 1832
Mass, Limited by Closed Markets*, Jan 2 p 82
Over, Cures for (Editorial), May 8 p 1409
Setbacks in Industries and Shares (Editorial), June 5 p 1703
Control in Building Large Machines*, Apr 3 p 997

Production Statistics:
Automobiles, 1929*, Jan 2 p 19; December, p 349; January, p 694; February, p 902; March, p 1237; April, p 1581; May, p 1942
British Pig Iron and Steel, December, p 248; January, p 597; February, p 879; March, p 1196; April, p 1478; May, p 1870
Canadian Pig Iron and Steel, November, p 105; December, p 476; January, p 768; February, p 1200; March, p 1361; April, p 1558

(**Production Statistics**, *Continued*)
Castings, Iron, January, p 770; February, p 1019; March, p 1356; April, p 1662
Castings, Malleable, November, p 187; December, p 349; January, p 613; February, p 893; March, p 1509; April, p 1790; May, p 1942
Castings, Steel, November, p 187; December, p 486; January, p 613; February, p 977; March, p 1509; Year, 1929, p 1764; April, p 1790; May, p 1942
Cement, Portland, January, p 695; February, p 879; March, p 1174
Coke, By-Product and Beehive, November, p 274; December, pp 283, 473; January, pp 526, 665; February, pp 880, 977; March, pp 1080, 1404; April, May, p 1868
Ferroalloys, 1929, Apr 3 p 1022
Lead, 1929, Feb 6 p 486; May 29 p 1616
Minerals, 1929, Feb 13 p 553
Ore, Molybdenum, 1929, May 8 p 1396
Ore, Newfoundland Hematite, 1929, Feb 20 p 597
Pig Iron, 1929, Apr 3 p 1022
Pipe, Cast Iron, 1929, Jan 9 p 154
Rails, 1929, Apr 3 p 1048, (Editorial), p 1028
Steel, Finished, 1929, June 12 p 1794
Steel Ingots and Castings, World, 1929, Jan 2 p 81
Steel Ingots, December, p 173; January, p 529; February, p 805; March, p 1097; April, p 1403; Year, 1929, p 1764; May, p 1771
Zinc, 1929, Feb 6 p 486; June 19 p 1868

Productivity:
Man-Hour 1914-1927*, Apr 3 p 1017

Profits:
In Foundries, Mar 27 p 936
Steel Deserves Fair (Editorial), Feb 6 p 457
Steel, Per Ton (Editorial), Apr 3 p 1027

Propellers:
Steel for Airplanes, Mar 20 p 860

Prosperity:
Basic Principles of (Editorial), Jan 30 p 389
Individual Is Key to, Jan 2 p 79

Prosser & Son, Thomas:
Stainless Steel Gage for Grinding Tungsten-Carbide Tools*, Apr 24 p 1232

Protractor:
Bausch & Lomb Optical Bevel*, Apr 24 p 1232

Puddling:
Mechanical, in Plant of Wrought Iron Co. of America*, June 19 p 1814

Pugh, M. D.:
Reclaiming Steel Foundry Sands, May 22 p 1523

Puller-Jack:
Edelblute*, Feb 13 p 520

Pullin, V. E.:
Air Ship Proved Sound by X-Ray, Apr 3 p 1007

Pullman, Inc.:
Merger with Standard Steel Car and Osgood Bradley Car Companies, Jan 2 p 108

Pumps:
Gasoline, Manufacture in Ferro Machine & Foundry Plant*, June 19 p 1805
Hills-McCanna Grease*, May 15 p 1476
Tuthill Variable and Reversible Flow, Feb 27 p 662
Ruthman Two-Stage*, Apr 3 p 1014

Putnam Machine Works:
Billet Gouger*, Mar 27 p 944

Q

Quick and Freeman:
Secondary Brittleness in Rail Steel*, Mar 6 p 714

R

Radiator Shells:
Rustless Steel, Forming and Polishing*, June 26 p 1887

Radio:
Business Editors Talk Over*, Apr 10 p 1079

Railroads:
Equipment Orders, 1929, Jan 2 p 21
Expenditures First Quarter, June 5 p 1725
Expenditures for Iron and Steel Products in 1929, June 19 p 1830
Expenditures Next Six Years, Estimated, Feb 20 p 581
Wharton & Northern and Mount Hope Mineral Sold, Feb 20 p 620

Rails:
Basic Bessemer Steel for, Mar 20 p 860
Breakages and Experiments with Heat-Treated, Apr 24 p 1224
Heavy, Apr 3 p 1028; (Editorials), Apr 10 p 1100; June 12 p 1773
Production, 1929—Record for Heavy Sections, Apr 3 p 1048, (Editorial) p 1028
Tensile Properties at Elevated Temperatures*, Mar 6 p 714
Transverse Fissure Problems, Present Status, May 22 p 1531
Transverse Fissures, Tests by Detector Car, May 29 p 1610

Ramming Machine:
Cleveland Sand*, June 26 p 1906

Ramp, Paul R.:
Steel Castings in Green Sand*, Mar 6 p 711
Training Foundry Apprentices*, Jan 16 p 215

Ransom Mfg. Co.:
Grinder Wheel Guards*, May 8 p 1398
Multi-Speed Grinder with Safety Devices*, Feb 6 p 451

Rastall, W. H.:
Replacing Depreciated Equipment, Jan 2 p 72

Rausch Mfg. Co.:
Die Filing Machine*, Apr 10 p 1086

Reading, A. K.:
Budget Control in Zimmerman Foundry, May 22 p 1538

Reading Iron Co.:
Increases Pipe Sizes, June 12 p 1792

Ready Tool Co.:
Ball-Bearing Tailstock Center*, Jan 9 p 161

Reamer:
Conradson Expansion*, Jan 9 p 160

Reed-Prentice Corporation:
Milling and Die Sinking Machine*, Feb 27 p 661

Reeves, Alfred:
Motor Industry, Apr 24 p 1236

Refined Steel Products Co.:
Refining Process for Cleaner Steel*, June 26 p 1894

Refractories:
For Non-Ferrous Furnaces, May 29 p 1600
In Open-Hearth Furnaces, May 29 p 1602

Refrigerators:
Manufacture on Conveyors*, Mar 27 p 928

Regulators:
Oxweld Two-Stage Oxygen, Jan 16 p 238
Weldit Duo-Control for Gases*, Feb 20 p 593

Reiter, Fred M.:
Heat Treating Machines*, May 15 p 1449

Reliance Electric & Engineering Co.:
Motor-Driven Rolling Mill Table*, Feb 6 p 437

Reliance Mfg. Co.:
Lock Washers of Rustless Steel, Mar 6 p 724

Republic Iron & Steel Co.:
Annual Report, Apr 3 p 1029

Republic Steel Corporation:
Capacity, Apr 10 p 1119
Operating Rustless Steel Finishing Division, May 29 p 1616
District Sales Managers, May 15 p 1481
Diversification of Products, Apr 10 p 1119
Merger Terms, Jan 30 p 387
Officers*, Apr 17 p 1164
Personnel Changes, May 1 p 1336

Research:
Growth (Editorial), Apr 17 p 1179
Industrial, Creates Employment, Feb 20 p 595
Scientific, Needed for Steel Industry, May 15 p 1459
Steel Corporation's Program, Jan 2 p 61
Value to Manufacture, Jan 23 p 291

Research Association:
Canadian Organized, Jan 16 p 249

Research Bureau:
Steel Corporation Establishes Trade, May 15 p 1480; (Editorial) p 1482

Revere Copper & Brass, Inc.:
Wins Harvard Medal for Advertisement, Mar 13 p 806

Richards, Joseph W.:
Memorial Lecture Fund Started, Mar 27 p 974

Richardson, W. S.:
Unit Costs Reduced by Planning, June 12 p 1768

Rickard, T. A.:
Early Uses of Metals, June 5 p 1673

Riggan and Smith:
Diversified Specifications Needed for Malleable Castings*, June 19 p 1825

Rigidmil
Sundstrand No 3-W*, Jan 9 p 162

Riter-Conley Co.:
Merged with McClintic-Marshall Co., Jan 9 p 191

Riveting:
New Method of, June 19 p 1813

Robbins & Myers, Inc.:
Hoists*, Apr 17 p 1162; May 1 p 1307

Roberts, George E.:
Business Reactions Natural, Apr 24 p 1229
Stock Market Speculation, Apr 10 p 1087

Rockford Drilling Machine Co.:
Green Bay Company Acquires Drilling Machine Line, Apr 17 p 1163

Rockwell Co., Stanley P.:
Heat-Treating Department*, Jan 30 p 375

Rodrick, A. H.:
Employees' Suggestions, Value of, Apr 17 p 1144
Foreman—Keystone of Industrial Arch, June 26 p 1877

Rods, Steel:
Stretch in Deep Wells, May 15 p 1462

Roebling's Sons Co., John A.:
Night School for Foremen*, Apr 10 p 1059
Stretching Wire Cable Beyond Working Load*, June 12 p 1748

Roessler & Hasslacher Chemical Co.:
Acquired by E. I. duPont de Nemours & Co., Apr 17 p 1170

Rolling Mills:
Acme New Hot Strip*, Mar 20 p 846
Bar, Youngstown Merchant at Indiana Harbor*, Feb 27 p 640
Capacity for Copper Rods*, Apr 24 p 1221
French Blooming Mill Electrical Equipment, Jan 16 p 237
Gulf States Steel to Build Continuous Sheet Mill, Jan 16 p 246
Lubrication Problems, May 15 p 1455
Rail, National Steel Corporation to Build, Feb 6 p 469
Sheet, Continuous Process Developments, Jan 2 p 47
Structural, for Aluminum Alloys*, Mar 6 p 707

Romanoff and Thieme:
Application of Ingot Metal to Production of Brass and Bronze, June 12 p 1745

Roofing:
Youngstown Battle-Deck Mill*, Feb 20 p 582

Rosenberg, Heyman:
Inventor of Self-Tapping Screws Honored*, June 12 p 1768

Rosenhain, Dr. W.:
Beryllium, Important New Metal for Aircraft, Feb 27 p 692

Ross, Daniel:
Roebling's Night School for Foremen*, Apr 10 p 1059

Ross Operating Valve Co.:
Air-Cylinder Operating Valve*, Feb 13 p 520

Rudolph, M.:
Corrosion of Plates and Rivets, Mar 6 p 713

Russ, E. F.:
Electric Induction Furnace, Apr 10 p 1092

Russia:
Americans to Develop Ore Mines, Apr 10 p 1126
Manganese Ore Exports, Jan 9 p 204
Prospects for American Business in*, Feb 27 p 652
Steel Mill Expansion, Jan 16 p 225
Steel Plant Contract to American Company, Mar 20 p 890
Trouble Ahead for (Editorial), Feb 13 p 531

Rust:
White, of Galvanized Wares, May 29 p 1610

Ruthman Machinery Co.:
Two-Stage Pump*, Apr 3 p 1014

Ryding, Herbert C.:
President Tennessee Coal, Iron & Railroad Co., Jan 30 p 412

Ryerson & Son, Inc., Joseph T.:
All-Steel Highway Crossing*, May 8 p 1398
Annual Report, Feb 6 p 478
Expansion at Detroit, Feb 6 p 446

Rys, Albert:
Heat Treating Alloy Steel Castings—Three Methods, June 19 p 1821

S

Safety:
Industrial, Fails to Interest Workers, Mar 13 p 806

Safety Fork:
American for Steel Rails*, Jan 30 p 376

Safety Signals:
For Overhead Cranes, Jan 23 p 317

St. John and Isenburger:
X-Raying Die Castings*, Apr 17 p 1135
X-Raying Large Steel Castings*, Feb 13 p 499

St. John X-Ray Service Corporation:
Organized, Apr 24 p 1242

Sales:
Buying Fatigue, May 8 p 1388

Sand:
Reclaiming Steel Foundry*, Feb 27 p 644; May 22 p 1523

Sand Blast Mask:
Standard Duo-Pressure, May 1 p 1300

Sand Mixer:
Clearfield*, May 1 p 1302

Sand Preparing Machine:
American Junior*, May 1 p 1310

Sanding Machine:
Porter-Cable with High-Frequency Motor*, Feb 27 p 662

Sato, S.:
Changes in Quenched Steel Upon Tempering, Mar 6 p 718

Saunders' Sons, Inc., D.:
Pipe Threading and Cutting Machine*, May 1 p 1331

Sauveur, Albert:
Cause of Hardness in Steel, Feb 13 p 501

Saws:
Circular, Tungsten Carbide Applied to*, June 19 p 1823
Disston Giant Metal-Cutting*, Feb 13 p 545
Porter-Cable Table Attachment for*, May 1 p 1331
Speedway Electric Hand*, Jan 9 p 161
Van Dorn Electric*, May 1 p 1326

Schade and Lee:
Structural Steel Heat Treated*, Feb 13 p 510

Schauer Machine Co.:
Speed Lathe for Polishing and Finishing*, Apr 3 p 1014

Schenck, P. D.:
Metal for Brass Pickling Containers, Mar 27 p 917

Schneider & Cie:
Development of Molybdenum Steel, May 1 p 1341

Scholarships:
For Metal Study, Apr 17 p 1176

Schrader's Sons, Inc., A.:
Bought by Scovil Mfg. Co., Jan 9 p 198

Schulz, E. H.:
White Rust of Galvanized Wares, May 29 p 1610

Schuster, L. W.:
Welded Pressure Vessels, Apr 17 p 1143

Schwab, Charles M.:
Awarded Gary Memorial Medal, May 15 p 1463
Industrial Outlook (Address at American Iron and Steel Institute Meeting), May 15 p 1463

Schwartz, Benjamin:
Scrap Industry Needs Consumers' Aid, Jan 23 p 307

Schwartz, H. A.:
Awarded Penton Gold Medal*, Jan 9 p 167
Factors Affecting Machinability of Malleable Cast Iron, May 22 p 1532

Scott, F. A.:
Machine Tool Outlook, Jan 2 p 45

Scott, Wirt S.:
Electric Furnace for Heating Small Parts*, Apr 24 p 1214

Scovil Mfg. Co.:
Buys A. Schrader's Sons, Inc., Jan 9 p 198

Scrap:
Alloy Steel, Study Proposed, June 26 p 1909
Composite Prices, with Comparisons, 1929*, Jan 2 p 87; First Quarter 1930*, Apr 3 p 1019
Conveyor System in Motor Wheel Plant*, Feb 27 p 631
Direct Dealing Condemned, June 26 p 1942
Exports of Iron and Steel, 1929, Feb 13 p 559
Handling in Waukesha Plant*, Mar 13 p 796
High Price of (Editorial), Mar 27 p 951
Industry Needs Consumers' Aid, Jan 23 p 307
International Movements (Editorial), Apr 24 p 1245
Shipping Board Sells Ships for, Apr 3 p 1020*
Sponge Iron Versus (Editorial), Mar 13 p 814
Steel, Gray Iron Made from, Mar 6 p 725
Steel, Why Has It Declined? (Editorial), June 5 p 1702

Screen:
Deister Foundry, with Vibrator*, May 1 p 1301

Screw Machine:
Davenport Redesigned*, June 12 p 1762

Screws:
Manufacture in Elco Plant*, May 8 p 1377

Seadromes:
New Outlet for Steel, Apr 24 p 1239

Segeler, C. George:
Gas Furnaces for Lead Hardening of Shovels*, June 26 p 1880

Selectors:
Brown & Sharpe Wire Gage*, Feb 20 p 593

Sellers & Co., William:
Large Double Plate Trimmer*, May 1 p 1323

Separator:
Beardsley & Piper Electric Magnetic*, May 1 p 1308

Seward, Percival:
Small Diameter Cast Iron Pipe for Plumbing and Heating*, May 29 p 1620

Shadgen, Joseph F.:
Mixing Industrial Gases*, Jan 16 p 219
Open-Hearth Furnace Control, June 26 p 1889

Shaping Machines:
Morton Attachment for Splining Hubs*, Feb 27 p 661
Morton Draw-Cut*, June 12 p 1761
Ohio Super-Dreadnaught*, June 19 p 1838

Sharpening Machines:
Wells Drill and Cutter*, Apr 17 p 1161

Shears:
Arc Welded*, Apr 10 p 1076
Buffalo Heavy-Duty Billet*, May 22 p 1547
United Machine Plate*, Feb 20 p 592

Sheet Metal Distributers:
(See National Association of Sheet Metal Distributers)

Sheet Metal-Ware:
Shipments, November, p 204; December, p 547; February, March, p 1501

Sheet-Metal Working Machine:
Peck, Stow & Wilcox Rotary*, June 19 p 1837

Sheets, Alloy Steel:
For Aircraft*, Feb 13 p 502

Sheets, Steel:
Cause and Cure of Stretcher Strains, Feb 13 p 516
Continuous Furnace for Normalizing, Feb 13 p 517
Developments in Rolling, Jan 2 p 47
Extras on Wide, High Finished, Mar 6 p 770
For Automobiles, Mar 27 p 931
Gan-Van-Alloy, Jan 16 p 272
Potential Markets for, June 26 p 1899
Production and Other Statistics, December, p 337; January, p 664; February, p 902; March, p 1276; April, p 1629; May, p 1938
Production at Newton Plant*, Apr 10 p 1064
Sticking, and Quality of Steel, Mar 13 p 795
World Trade, 1929, Apr 24 p 1240

"Sheffield":
Maintaining Name of, Jan 16 p 269

Sheffield Steel Corporation:
Acquired by American Rolling Mill Co., May 22 p 1554
Manufacture of Bridge Wire*, Apr 17 p 1147

Shepard Niles Crane & Hoist Corporation:
Hoisting and Carrying Equipment*, May 1 p 1310

Shipbuilding:
Employment Gains, June 26 p 1912
Expansion Program, Jan 2 p 25
Prospects, Three Years, May 15 p 1500
Recent Welding in Industry, May 15 p 1454
Ocean Mail Contracts, Mar 27 p 974; May 15 p 1478
Steel Tonnage for Mail Vessels, Jan 23 p 320; Mar 6 p 761; May 1 p 1361; May 29 p 1649
Welded Lighter Than Riveted, Apr 17 p 1158
World, Jan 16 p 253; Apr 17 p 1196

Shipping Board:
Sells Ships for Scrapping, Apr 3 p 1020; June 12 p 1795

Shore:
Symons Adjustable, with Safety Lock*, Feb 20 p 594

Shovels:
Gas Furnaces for Lead Hardening*, June 26 p 1880

Siberia:
Freyn Engineering Co. to Build Steel Plant in*, June 19 p 1842

Sikorsky Aviation Corporation:
Aircraft Construction*, Jan 30 p 362
Machines Run from Unusual Overhead Power Circuit*, Feb 27 p 659

Silver:
Fall of (Editorial), Apr 3 p 1026

Silver Solder:
Handy & Harman for Stainless Steel, Jan 16 p 238

Simonds, A. T.:
1930 Essay Contest, June 19 p 1842
Business Forecast*, June 12 p 1767
Business Reaction Not Yet Completed*, Feb 27 p 648; Apr 24 p 1239
Forecast of Industrial Production*, Jan 2 p 69

Simplex Piston Ring Co. of America, Inc.:
Electric Bluing Furnace*, Apr 10 p 1083

Simplex Tool Co.:
Engraving Machine*, June 12 p 1761
Nesting Bins*, June 26 p 1907
Utility Press*, Jan 30 p 377; Feb 13 p 520

Simplifications:
(See also Standardization)
Abrasive Grain Sizes, May 1 p 1333
Allowable Limits for Sizing Abrasives, June 5 p 1725
Aluminum Oxide Abrasives, May 29 p 1616
An Aid for Better Business, Jan 2 p 73
Bolts, Packaging List Revised, Apr 10 p 1082
Hack-Saw Blades Revised, June 5 p 1724
Removable and Permanent Concrete Forms, Feb 13 p 559
Shovels, Spades and Scoops, Feb 20 p 623

Simpson, R. W.:
Open-Hearth Furnace Control, June 26 p 1889

Sintering:
Limonitic Iron Ores*, Feb 27 p 642

Sivyer Steel Casting Co.:
Acquires Nugent Steel Castings Co., Feb 20 p 613

S. K. F. Industries, Inc.:
Manufacture of Ball Bearings*, Mar 6 p 703

Slag:
Bulldog, as Related to Steel, May 15 p 1457
Effect of Alumina in Steel Melting Furnaces, Mar 20 p 845

Sly Mfg. Co., W. W.:
Tumbling Mill*, May 8 p 1393

Smalley, Oliver:
Foundry and Cupola Practice, Mar 20 p 879

Smith and Riggan:
Diversified Specifications Needed for Malleable Castings*, June 19 p 1825

Smith Corporation, A. O.:
Manufacture of Automobile Frames*, June 5 p 1665
Pressure Test of Welded Alloy Steel Drum*, June 19 p 1809
Welded Gas Containers Disapproved, Mar 6 p 728

Smith, Elliott D.:
Hiring Age Limit, Feb 6 p 453

Smith, Lewis A.:
Gains in Chromium Consumption, Feb 6 p 474
Manganese Production, 1928, Mar 27 p 952

Smith, William H.:
Sponge Iron from Brazilian Ore*, May 1 p 1298

Snyder Mining Co.:
Organized, Feb 13 p 552

Society of Automotive Engineers:
Officers, Jan 30 p 410
Nominations for 1931, June 5 p 1700

Solder:
Silver, Handy & Harman, Jan 16 p 238

South Africa:
Iron and Steel Institute to Be Formed in, Feb 13 p 545
Steel Mills to Consolidate, May 8 p 1436

South African Iron & Steel Industrial Corporation, Ltd.:
Steel Plant Cost, Mar 13 p 804

Southwark Foundry & Machine Co.:
Machine for Testing Welds*, May 15 p 1475; May 22 p 1547
Universal Testing Machine*, Feb 13 p 521

Spang, Chalfant & Co.:
Merged with National Supply Co., June 26 p 1910

Specifications:
Advantages of Buying Under, Feb 6 p 452
British Bar Basic Bessemer Steel, June 12 p 1796; June 26 p 1913

Speed Reducers:
Falk Right-Angle Drive*, Feb 6 p 447
Gears & Forging Three, Jan 16 p 239

Speedway Mfg. Co.:
Electric Hand Saw*, Jan 9 p 161

Spending:
And Saving (Editorial), Feb 6 p 456
Individual and Corporate (Editorial), Jan 16 p 250

Spiegeleisen:
Imports, 1929, Mar 6 p 768; First Quarter, May 8 p 1407

Sponge Iron:
(See Iron)

Springs:
Torsional, Formulas*, Jan 23 p 303
Vanadium Steels for Railroad, Feb 13 p 525

Stainless Steel:
(See Steel)

Stamets, William K.:
Automatic Spline Miller*, Mar 27 p 945

Stampings:
Drawn, of Rustless Steel*, June 12 p 1755

Standard Foundry Co.:
Duplexing Iron Castings with Electric Furnace*, May 8 p 1372

Standard Safety Equipment Co.:
Sand Blast Mask, May 1 p 1300

Standard Steel Car Co.:
Merged with Pullman, Inc., and Osgood Bradley Car Co., Jan 2 p 108

Standard Steel Works:
All-Aluminum Truck Tank*, Jan 16 p 239

Standardization:
(See also Simplification)
An Aid for Better Business, Jan 2 p 73

(Standardization, *Continued*)
Economies Through, May 8 p 1389
Gages Recommended, June 5 p 1691
Gages, Pressure, May 8 p 1431
Gears, May 8 p 1395
Westinghouse Standardizes on Steel Desks and Chairs, June 26 p 1902

Standards:
Malleable Screwed Unions, Apr 10 p 1087

Starke, Edward W.:
Retires from Caswell & Starke, Inc., May 15 p 1479

Statistics:
Super, Needed (Editorial), Apr 17 p 1178

Steel:
(See also Alloy Steel)
Barge Consumption, 1929, Jan 16 p 243
Chemistry of*, May 22 p 1536
Chromium, Five-Year Corrosion Test, May 15 p 1454
Cleaner, Densite Refining Material for*, June 26 p 1894
Copper-Bearing, Corrosion of, Apr 3 p 1028
Demands of Metal Consuming Industries (Editorial), Jan 2 p 106
Deoxidation in Making, Apr 24 p 1223
Determining Inclusions Electrolytically, Apr 10 p 1100
Distribution Hard to Follow (Editorial), Mar 13 p 812
Distribution to Consuming Industries, 1929*, Jan 2 p 9
Duplex and German Practices Compared, June 12 p 1760
Duplex Practice, Methods of Control of Slag and of Oxidation, Mar 27 p 925
Exports, Distribution 1929, Feb 6 p 485; First Quarter, May 8 p 1438
Finished, Production 1929, June 12 p 1794; (Editorial), p 1774
For House Construction, May 29 p 1609
From Indian Pig Iron, Mar 20 p 845
Hardness in, Cause of, Feb 13 p 501
Ingots and Castings, World Production, Jan 2 p 81
Ingots, Capacity, Four Years (Editorial), May 15 p 1483; 10 Years*, May 1 p 1329; 1929, May 8 p 1418
Ingots, Heterogeneity in and Its Amelioration, Jan 30 p 368
Ingots, Pouring, Best Conditions for, Mar 27 p 920
Ingots, Production, 1929, June 12 p 1764
Ingots, Production by Months, December and Year, p 173; January, p 529; February, p 805; March, p 1097; April, p 1403; May, p 1771
International Outlook in, Jan 2 p 27
Liquid, Determining Iron Oxide in, May 8 p 1386
Manganese, Microstructure of Medium, Feb 20 p 570
Medium-Manganese for Seamless Tubing, Apr 10 p 1075
Melting Progress Report, June 5 p 1671
New Uses for, Jan 2 p 74; (Editorial), May 15 p 1482
Nitrided, Corrosion of, May 22 p 1531
Open-Hearth, Alloy Contamination, June 5 p 1671
Output Almost Normal, Apr 24 p 1244; May 1 p 1338
Production—an Average Year in (Editorial), Mar 20 p 882
Production of Different Forms, 1929*, Jan 2 p 10
Production Will Be Steady (Editorial), Jan 2 p 107
Profits, Deserves Fair (Editorial), Feb 6 p 457
Profits Per Ton (Editorial), Apr 3 p 1027
Properties at High Temperature, Apr 3 p 1020
Quality and Combustion Control in Making*, June 5 p 1669
Quality, and Sticking of Sheets, Mar 13 p 795
Quenched, Changes Upon Tempering, Mar 6 p 718
Rail, Secondary Brittleness in*, Mar 6 p 714
Rods, Stretch in Deep Wells, May 15 p 1462
Stainless, British Version of Origin, Jan 30 p 361; Chromium-Manganese*, May 15 p 1468; Chrome-Nickel, Unusual Products of*, June 12 p 1735; Drawn Stampings of*, June 12 p 1755; For Automobiles and Buses, Mar 27 p 930; Forming and Polishing Radiator Shells*, June 26 p 1887; Status, Jan 2 p 85; Tests for Ford Cars*, Feb 20 p 594; Used at Assouan Dam, Mar 20 p 867; Watches Made of*, May 15 p 1460; Wide Use by British, Jan 16 p 248
Steadiness in (Editorial), Feb 20 p 598
Strip, Cause and Cure of Stretcher Strains, Feb 13 p 516
Structural, and Cement, Ratio, 1913-1929 (Editorial), Feb 13 p 530
Structural, Chromium-Copper, May 15 p 1484
Structural, H-Beams to Carry Power Wire, June 26 p 1892
Structural, Heat Treated*, Feb 13 p 510
Structural, Large Growth (Editorial), Jan 23 p 323
Structural, Weldability of, Feb 13 p 512
Swedelec, New Magnetic, Feb 6 p 474
Tool, Causes of Failures, Mar 6 p 743
Tool, Composition and Properties of 14 Types*, Mar 13 p 784
Tool, Failures, Feb 20 p 583
Tool, Rational Choice of*, Mar 13 p 782
Trade Names of American, Jan 16 p 275
Used for Gears*, Feb 13 p 503
Vanadium, for Railroad Equipment, Jan 23 p 297

Steel & Tubes, Inc.:
Manufacture and Properties of Light Welded Tubing, Apr 17 p 1146

Steel Barrels:
Shipments, November, p 274; December and Year, p 478; January, p 695; February, pp 976, 1092; March, p 1410; April, p 1692

Steel Buildings:
Genfire Portable, June 19 p 1845

Steel Founders' Society of America:
Capacities of Steel Foundries of United States and Canada, Jan 2 p 59
Discusses Costs and Uses, Feb 13 p 522
Forms Alloy Steel Castings Division, May 22 p 1552
Urges Foundries to Give Engineering Service, Apr 3 p 1020

Steel Furniture:
Shipments and Orders, November, p 204; December, p 477; January, February, p 976; March, p 1237; April, p 1866

Steel Horse:
Toledo Folding*, May 15 p 1475

Steel Industry:
Capacity, Four Years (Editorial), May 15 p 1483; 10 Years*, May 1 p 1329; 1929, May 8 p 1418
Capacity, Increasing, (Editorial), Jan 16 p 250
Changes in Manufacture, May 15 p 1505
Future of American, Mar 6 p 719
New Construction, 1929, Jan 2 p 97
Production and General Trade (Editorial), May 8 p 1408
Review of Year 1929*, Jan 2 p 1
Scientific Research Needed for, May 15 p 1459
Size Helps Its Growth (Editorial), Feb 20 p 599
What of 1930? (Editorial), Jan 2 p 106

Stephens-Adamson Mfg. Co.:
Control for Speed Changers*, Feb 13 p 520

Stern, Marc:
Progress in Die Casting Industry, May 29 p 1599

Stevens, William H.:
Bulldog Slag as Related to Steel, May 15 p 1457

Stewart, Paul W.:
Given Harvard Award for Market Data Handbook, Mar 6 p 769

Stibloy:
Metallic Liquid for Protecting Galvanizing, Apr 10 p 1088

Stock Market:
Collapse—More Chance for the Job (Editorial), Jan 16 p 251
Returns (Editorial), Mar 13 p 813
Setbacks in Industries and (Editorial), June 5 p 1703
Speculation an Erratic Variable, Apr 10 p 1087

Stocks, C. W.:
Bus Transportation a Growing Industry, Jan 2 p 15

Stone Pattern Mount Co., Inc.:
Mounts for Loose or Gated Patterns*, May 8 p 1393

Stoughton and Greiner:
Iron-Silicon Equilibrium Diagram*, May 8 p 1385

Stoughton, Bradley:
Economic Aspects of Sponge Iron, Mar 13 p 790

Stoves:
Straight Line Production in Detroit Plant*, Feb 13 p 493

Straightening Machine:
Wells No. 8 Wire Rod*, May 22 p 1546

Strauss & Co., S. W.:
Building Outlook, Feb 6 p 477

Strip Mills:
(See Rolling Mills)

Strong, Carlisle & Hammond Co.:
Electric Bluing Furnace*, Apr 10 p 1083

Suggestions:
From Employees, Apr 17 p 1144

Sunderland, C. C.:
Stretching Wire Cable Beyond Working Load*, June 12 p 1748

Sundstrand Machine Tool Co.:
No. 3-W Rigidmil*, Jan 9 p 162

Surfacing Machine:
Fay & Egan*, Apr 3 p 1012

Swaging Machine:
Langelier, for Taper Pins*, Jan 30 p 377; Wire Spoke*, Jan 23 p 316

Swedelec:
New Magnetic Steel, Feb 6 p 474

Swift Electric Welded Co.:
Automatic Spot Welder*, May 15 p 1476

Swindell & Brothers, William:
Merger with American Dressler Tunnel Kilns, Gas Combustion and Duquesne Burner Service Companies, June 19 p 1832

Switchboards:
General Electric, New Panels, Feb 27 p 662

Symons Clamp & Mfg. Co.:
Adjustable Shore with Safety Lock*, Feb 20 p 594

T

Tabor Mfg. Co.:
Hand Rollover Molding Machine*, May 15 p 1474

Talbot Process:
In German Steel Furnace*, Jan 23 p 309

Talking Picture:
George M. Verity Makes*, May 15 p 1456

Tank Cars:
Welded Gas Disapproved, Mar 6 p 728

Tanks:
Standard All-Aluminum Truck*, Jan 16 p 239

Tapping Machine:
Globe Automatic Multiple-Spindle*, Feb 6 p 448
Landau Combination Drilling and*, May 22 p 1551

Tariff:
Aspect (Editorial), June 12 p 1772
Australian Emergency, Apr 10 p 1087
British Steel Urged, June 5 p 1727
Canadian Revision, May 8 pp 1404, 1411; June 12 p 1797
Graphite, Jan 30 p 390
Metal Duties Stay (Editorial), June 19 p 1846
Metal Schedule, Changes, Mar 20 p 878; June 19 p 1841
Metal Schedule Rates in Hawley-Smoot Bill, Apr 17 p 1173
Pig Iron, Apr 10 p 1096
Senate Reduces Iron and Steel Duties, Feb 20 p 606

Tate, James:
"Metric" Countries Not Always Metric, Mar 20 p 885

Taylor, C. M.:
Arc Welded Presses and Shears*, Apr 10 p 1076

Taylor, Maurice:
To Cast or to Weld—a Comparison*, Mar 20 p 861

Taylor Society:
Convention Proceedings, May 8 p 1388

Taylor-Winfield Corporation:
Challenger Welding Machine*, Apr 10 p 1084
Flash Welder for Automobile Trunks*, May 22 p 1546

Technical Products Co.:
Asbestos in Paint Form, May 8 p 1398

Tennessee Coal, Iron & Railroad Co.:
Expansion Plans, Apr 10 p 1101; Apr 17 p 1199
Ryding, Herbert C., President, Jan 30 p 412

Testing Device:
Dietert for Hardness of Molds*, May 1 p 1311

Testing Machine:
Brinell Hardness, Portable, June 19 p 1845
Firth Hardometer*, May 8 p 1397
Lindsay Delco Core Strength*, May 22 p 1551
National-Cleveland Gear*, Mar 6 p 732
Southwark for Welds*, May 15 p 1475; May 22 p 1547
Southwark Universal*, Feb 13 p 521

Tests:
Cast Iron, Correlation of, June 5 p 1679
Chain, Hand Welded Steel, June 19 p 1809
Die Castings, Aluminum and Zinc Base, Jan 9 p 157
Electric Welds of ½-In. Plate*, May 29 p 1606
Paint Coatings and Strength of Riveted Joints, Mar 27 p 917
Stainless Steel Used in Ford Cars*, Feb 20 p 594
Structural Welds, Feb 27 p 632
Weldability of Structural Steel, Feb 13 p 512
Welded Alloy Steel Drum Under High Pressure*, June 19 p 1809

Thaden, H. V.:
All-Metal Airplanes, Mar 20 p 858

Thibaut, L.:
French Manufacture of Bronze Alloys, Feb 13 p 545

Thieme and Romanoff:
Application of Ingot Metal to Production of Brass and Bronze, June 12 p 1745

Tholand, N. G. K.:
Grades of Sponge Iron, Mar 20 p 850

Thomas, E. P.:
Addresses Flat Rolled Steel Manufacturers, June 26 p 1913

Thomas Spacing Machine Co.:
Bending and Straightening Machine*, Feb 27 p 663
Column Facing Machine*, Jan 9 p 160

Thompson, C. M.:
Application of Tungsten Carbide to Circular Saws*, June 19 p 1823

Thoresen, S. A.:
Tunnel Lining of Welded Steel*, Apr 3 p 985

Thread Milling Machine:
Wells for Taps*, May 1 p 1328

Threading Machines:
Landis 1-In. Forming and*, June 5 p 1691
Oster Bench-Type Power*, May 29 p 1620

Thrift:
Again Has Its Day (Editorial), May 22 p 1560

Thum, E. E.:
Medium-Manganese Steel for Seamless Tubing, Apr 10 p 1075
Molybdenum Steels, Survey of Applications*, Jan 9 p 141
Welded Structures*, May 1 p 1320
Welding Practices in Baldwin Tank Shop*, Mar 6 p 715
Welding, Rapid Strides Made in*, Jan 2 p 50

Timken Roller Bearing Co.:
Annual Report, Mar 20 p 875

Tin:
In Adjustment Period, Jan 2 p 93
Restricting Output and Stabilizing Prices, Jan 23 p 315

Tin Plate:
Lower Prices Asked for, Jan 23 p 312
What the Buyer Should Know About, Apr 10 p 1066

Titze, W.:
Quality of Steel and Sticking of Sheets, Mar 13 p 795

Toledo Machine & Tool Co.:
800,000-Lb. Crank Press*, Mar 27 p 945

Toledo Pressed Steel Co.:
Folding Steel Horses*, May 15 p 1475

Tomkins-Johnson Co.:
Air-Operated Arbor Press*, June 12 p 1762

Tool Steel:
(See Steel)

Tools:
Working, Suspended from Crane*, Apr 17 p 1156

Tongs:
Williams, for Both Pipe and Fittings*, Feb 6 p 447

Touceda, Enrique:
Progress in Malleable Iron, May 1 p 1297

Trackwork:
Shipments, December, p 249; January, p 623; February, p 880; March, p 1174; April, p 1506; April, p 1867

Tractors:
Production and Exports, 1922-1929*, May 15 p 1507
Whitehead & Kales Industrial "Tug"*, Feb 27 p 660

Trade Names:
American Steels, Jan 16 p 275

Trade Practice:
American Institute of Steel Construction Rules Adopted, Jan 30 p 384
Conferences Successful, Feb 13 p 560
Uniform for Foundries, Jan 9 p 191

Trailer:
Mercury, for Hot Strips and Plates, Mar 20 p 869

Trick, E. H.:
Plant Automobile Parking Space*. June 19 p 1831

Trimming Machines:
Waterbury Bolt-Head*, June 26 p 1907

Trolley:
Northern Engineering Crane with Aluminum Parts*, May 1 p 1307

Trucks:
Automatic Tiering-Lifting*, May 1 p 1307
Clark Lifting and Tilting*, May 1 p 1301
Elwell-Parker Lift, Side-Dump and End Dump*, Feb 13 p 519
Frames, Alloy Steel*, Jan 16 p 227

Tubes:
(See also Pipe)
Manufacture at Laclede Plant*, Apr 24 p 1226
Light Welded, Manufacture and Properties of, Apr 17 p 1146

(Tubes, *Continued*)
Seamless, Medium Manganese-Steel for, Apr 10 p 1075
Tum-Blast:
American Improved*, May 1 p 1306
Tumbling Mills:
Sly, with Roller Bearings*, May 8 p 1393
Tungsten Carbide:
Application to Circular Saws*, June 19 p 1823
Cemented, Hard Metal Carbides and*, Feb 27 p 646
Tungsten-Carbide Tools:
Abrasive Compound for Lapping*, May 15 p 1477
Developments (Editorial), Mar 6 p 740
Firth-Sterling Mechanigript Tip*, Feb 27 p 663
Grinding, Stainless Steel Gage for*, Apr 24 p 1232
Illustrated Lecture on, May 22 p 1556
Increase in Use of*, Jan 2 p 57
Properties and Uses of*, Mar 20 p 863
Tunnel:
Detroit-Windsor, Lining of Welded Steel*, Apr 3 p 985
Turbo-Blowers:
With Chromium-Nickel Blades, Feb 27 p 636
Tuscany, Arthur J.:
Cast Iron Holds Its Strong Position, May 29 p 1632
Developments in Gray Iron Industry, Apr 17 p 1143; May 15 p 1462
Tuthill Pump Co.:
Variable and Reversible Flow Pump, Feb 27 p 662

U

Ultra Fuzon Distributing Co.:
Aluminum Paint, Mar 6 p 724
Union Carbide & Carbon Research Laboratories:
Welding Rod, Mar 27 p 944
Union Drawn Steel Co.:
Fairless, B. F., President, May 15 p 1481
United Machine Tool Corporation:
Plate Shears*, Feb 20 p 592
United States Aluminum Co.:
Aluminum Alloy Crane*, June 5 p 1689
United States Cast Iron Pipe & Foundry Co.:
Annual Report, Aug 17 p 1172
United States Electrical Tool Co.:
Drills with Bohnalite Housings*, Apr 3 p 1012
United States Rubber Co.:
Paying Dismissal Wage, Feb 6 p 459
United States Steel Corporation:
Annual Meeting, Apr 24 p 1235
Annual Report, Jan 30 p 386; Mar 20 p 870; (Editorial), Mar 27 p 951; Quarterly Report, May 1 p 1333
Buys Morris & Bailey Plant, June 12 p 1792
Elgin, Joliet & Eastern Railroad Sued by Government, June 26 p 1933
Forms Columbia Steel Co. as Subsidiary, June 26 p 1932
Making Stainless and Heat-Resistant Steels, May 22 p 1546
New Plants to Make 24-In. Pipe, May 22 p 1563
Offers Common Stock to Employees, Jan 16 p 261
Pension Disbursements, Feb 6 p 477
Research Bureau, Trade, May 15 p 1480, (Editorial) p 1482
Research Program, Jan 2 p 61
Shows Three-Year Cycle,* Jan 2 p 86
Tax Refunds, Mar 20 p 870
To Expand Alabama Mills, Feb 27 p 702
Unfilled Orders, December, p 246; January, p 550; February, p 811; March, p 1165; April, p 1509, (Editorial) p 1483; May, p 1790
Universal Crane Co.:
Crane to Expedite Building and Demolition*, June 5 p 1694
University of Illinois:
Course in Gas Engineering, May 15 p 1476
Materials Testing Laboratory*, May 29 p 1594
Teaching Heat Treating*, Mar 27 p 915
University of Wisconsin:
Foundry Conference Program, Jan 30 p 410
Upsetting Forging Machine:
Ajax, Installation in Spang-Chalfant Plant*, May 15 p 1473
Upthegrove, Prof. Clair:
Automobile Bearing Metals, Mar 27 p 931
Utilities:
Public, Expenditure Program, Mar 6 p 736
Utley, S. Wells:
Apprentice Training, June 5 p 1685

V

Valenta, Dr. E.:
Production of Gray Iron in Electric Furnace, Feb 13 p 532
Valves:
Best Steels for, May 15 p 1470
Ross Air-Cylinder Operating*, Feb 13 p 520
Van Dorn Electric Tool Co.:
Electric Saw*, May 1 p 1326
Vapor Baths:
Carrier Process for Degreasing Metals, Jan 16 p 240
Vaughan, A. H.:
Electric Heat-Treating Furnaces*, Jan 30 p 357
Verity, George M.:
Makes Talking Picture*, May 15 p 1456
Virginia Iron, Coal & Coke Co.:
Annual Report, Apr 10 p 1134
Vocations:
Changes in, Jan 2 p 68

W

Wages:
(See Labor)
Wallace & Co., J. D.:
Hand Jointer with Skew Knife Cutterhead*, June 19 p 1837
Walton, Albert:
Why Not Profits in Foundries, Mar 27 p 936
Walls, Fred J.:
To Present Exchange Paper in England, May 8 p 1411
Ward, Gerald C.:
Examining Arc Welds for Quality*, Jan 30 p 369
Warner & Swasey Co.:
50th Anniversary*, May 29 p 1625, (Editorial), p 1631
Washburn Co.:
Acquires Wire Goods Department of Wickwire-Spencer Steel Co., Feb 6 p 469
Washburn Shops:
Lombard Automatic Starter or Clutch*, Apr 10 p 1084
Washers:
Reliance, of Rustless Steel, Mar 6 p 724
Washington Coal & Coke Co.:
Purchased by H. C. Frick Coke Co., June 19 p 1832
Waste:
Eliminating Industrial, Jan 2 p 67
Eliminating, Prize Offered for Best Suggestion, Apr 24 p 1242
Heat, Economies Through Use of*, June 5 p 1681
Overproduction, Committee to Study, Jan 16 p 244
Prevention Through Foreman-Manager Plan*, Mar 13 p 777, (Editorial) p 814
Watches:
Made of Stainless Steel*, May 15 p 1460
Waterbury Farrel Foundry & Machine Co.:
Bolt Head Trimming Machine*, June 26 p 1907
Waterways:
Developments in Pittsburgh District, 1929, Jan 2 p 95
Improvements of Mahoning and Shenango Rivers Urged, Feb 6 p 477
Traffic in Pittsburgh District, November, p 96; December, p 384; January, p 702; February, p 1019; March, p 1262; April, p 1558
Watson-Stillman Co.:
Hydraulic Cross-Head Pin Ejector*, June 19 p 1839
Waukesha Motor Co.:
Scrap Handling Equipment*, Mar 13 p 796
Wealth:
Habits of Living and (Editorial), Feb 27 p 667
Wean Engineering Co.:
Tin Plate Piling Apparatus*, Mar 13 p 799; Apr 3 p 1019
Wearing Strips:
Michigan Replaceable for Guides*, Apr 10 p 1085
Weaver, J. R.:
Making Jigs and Fixtures by Welding*, Jan 16 p 232
Webster, J. E.:
Iron and Steel Industry on Pacific Coast, Feb 27 p 649
Webster, W. R.:
Season Cracking of Brass,* Mar 27 p 932
Weinland, H. G.:
Grinding Machine Developments, Jan 2 p 54
Weirton Steel Co.:
Rebuilds Blast Furnace in 92 Days, Apr 17 p 1166
Welch, A. W.:
Industrial Building, 1929*, Jan 2 p 18
Welding:
19-Story Building in Dallas, June 19 p 1832
Aircraft, Limitations on, Jan 23 p 297
Applications of (Editorial), Jan 23 p 322

(Welding, *continued*)
Arc, Presses and Shears*, Apr 10 p 1076
Battle-Deck Roof*, Feb 20 p 582
Cast Iron Versus Welded Steel*, Mar 20 p 861
Current, Studies of, Feb 6 p 458
Drums for Power Boilers, May 1 p 1320, (Editorial) p 1339
Effect of Heat Treatment on Structural Steel, Feb 13 p 512
Efficiency of Multiple-Operator Sets, Mar 13 p 793
Electric, Tests of ½-In. Plates*, May 29 p 1606
Fabrication by, Westinghouse Shop*, Feb 20 p 585
Grinding Machine Parts of Welded Steel*, June 19 p 1818
Gun Carriages, May 22 p 1522
Helium Gas Tanks Disapproved, Mar 6 p 728
In Baldwin Tank Shop*, Mar 6 p 715
In Construction of Cranes*, Feb 13 p 509
In Shipbuilding, Apr 17 p 1158; May 15 p 1454
Lincoln Electrode for Light Sheet, June 5 p 1701
Line Joints for Steel Pipe*, Feb 6 p 435
Process, Unique, a By-Product of Research*, June 5 p 1684
Progress in*, Jan 2 p 50
Making Jigs and Fixtures by*, Jan 16 p 232
Pressure Vessels, British Views, Apr 17 p 1143
Specifications for, Jan 23 p 324
Structural Frame Joints*, Jan 16 p 222
Structural, German Practices, May 22 p 1562
Structural Girders*, May 8 p 1382
Structural, Tests of, Feb 27 p 632
Structures, Important, May 1 p 1320
Tunnel Lining of Welded Steel*, Apr 3 p 985

Welding Machines:
American Tube*, Apr 17 p 1161
General Electric with Current Regulator, Mar 6 p 735
Lincoln Automatic Tube*, Apr 3 p 1013
Lincoln Carbon, Arc*, Jan 30 p 377
Lincoln Rear Axle Housing Automatic*, June 26 p 1908
Single vs. Multiple-Operator, Apr 24 p 1246
Swift Automatic Spot*, May 15 p 1476
Westinghouse with Flexactor*, Mar 6 p 735
Wilson Light Weight Arc*, Apr 17 p 1163
Taylor-Winfield Challenger*, Apr 10 p 1084
Taylor-Winfield Flash*, May 22 p 1546

Welding Rods:
Union Carbide & Carbon Research Laboratories, Mar 27 p 945

Weldit Acetylene Co.:
Duo-Control Regulator for Gases*, Feb 20 p 593

Welds:
Arc, Examining for Quality*, Jan 30 p 369

Wellman Engineering Co.:
New Name of Wellman-Seaver-Morgan Co., Feb 27 p 664

Wellman-Seaver-Morgan Co.:
200-Ton Car Hoist*, Jan 16 p 240

Wells Co., Frank L.:
No. 8 Wire Rod Straightener*, May 22 p 1546

Wells Mfg. Co.:
Drill and Cutter Sharpening Machines*, Apr 17 p 1161
Thread Milling Machine*, May 1 p 1328

Werner, Wilbur S.:
X-Raying Prevents Foundry Losses*, May 1 p 1290; May 15 p 1466

Western Electric Co.:
Cable and Wire Plant*, May 29 p 1611

Western Metal Congress and Exposition:
Subcommittees, Apr 24 p 1259

Westinghouse Air Brake Co.:
Combines Automotive Lines with Bendix Aviation Corporation, Mar 6 p 728

Westinghouse Electric & Mfg. Co.:
Electric Eye for Determining Temperature or Illumination*, Apr 24 p 1231
Electric Furnace for Heating Small Parts*, Apr 24 p 1214
Engineering Graduates' Training Course*. June 12 p 1741
Fabrication by Welding, Shop for*, Feb 20 p 585
High-Speed Induction Motor*, Feb 13 p 521
Making Jigs and Fixtures by Welding*, Jan 16 p 232
Mill-Drive Double Gear Unit, Apr 10 p 1086
Nitriding Furnace, Bell Type, June 26 p 1906
Phos-Copper Welding Rod, June 12 p 1763
Research Advisory Board, Apr 24 p 1239
Standardizes on Steel Desks and Chairs, June 26 p 1902
To Cooperate with British Firm, June 26 p 1941
Welding Machine with Flexactor*, Mar 6 p 735

Westphal, Frederick A.:
Manufacture of Bridge Wire*, Apr 17 p 1147

Wheat Market:
Playing the (Editorial), Mar 20 p 884

Wheeler, E. S.:
Monel Metal and Nickel Foundry Practice, June 12 p 1754

Wheeling Mold & Foundry Co.:
Anvil Base of Two Steel Castings*, May 8 p 1407

Wheeling Steel Corporation:
Annual Report, Mar 20 p 879; Quarterly Report, May 8 p 1411
New Black Plate Process, Mar 20 p 879

White, H. E.:
Refractories for Non-Ferrous Industries, May 29 p 1600

White Metals Institute:
(See Institute of White Metals)

Whitehead & Kales Co.:
Industrial "Tug"*, Feb 27 p 660

Whiting Corporation:
Teapot Ladle with Split Spout*, May 1 p 1311

Wickwire-Spencer Steel Co.:
Sells Wire Goods Department, Feb 6 p 469

Wilbraham-Green Blower Co.:
Cupola Blower*, May 1 p 1311

Wilcox-Rich Corporation:
Merged with Eaton Axle & Spring Co., Feb 27 p 665

Williams & Co., J. H.:
Tongs for Both Pipe and Fittings*, Feb 6 p 447

Williams, C. G.:
Cast Iron, Future of, June 19 p 1848
Hails Promise of Alloy Irons, June 5 p 1704

Williams, J. Harvey:
Outlook in Drop Forgings, Jan 2 p 96

Wilson, E. F.:
Features of Pulverized Coal-Fired Air Furnace, May 22 p 1532

Wilson Foundry & Machine Co.:
Mechanized Details Augment Output, Apr 17 p 1143

Wilson Welder & Metals Co.:
Arc Welder, Light Weight*, Apr 17 p 1163

Winans, W. R. R.:
Airplanes with Metal Rib Wings*, Jan 16 p 230

Window Washing Equipment:
Cleveland Electric Tramrail*, May 8 p 1369

Winlock and Kelley:
Sheet Steel, Cause and Cure of Strecher Strains, Feb 13 p 516

Winslow, F. B.:
40-In. Locomotive Moves Under Own Steam*, Apr 3 p 996

Wire:
Bridge, Manufacture of*, Apr 17 p 1147
Cable, Spontaneous Cracking of, June 19 p 1848
Cable, Stretching Beyond Working Load*, June 12 p 1748
Copper, Defects in*, Mar 15 p 792
Insulated, Manufacture in Western Electric Plant*, May 29 p 1611

Wire Cloth:
Ludlow-Saylor*, Jan 16 p 238

Wire Rope:
A. S. M. E. Publishes Discussions on, Jan 9 p 172

Wire Wheel Corporation of America:
Making Wire-Wheel Hubs*, Feb 20 p 571

Wisconsin Steel Co.:
Replaces 50-Year Old Blast Furnace*, June 12 p 1750

Wood, Joseph K.:
Torsional Spring Formulas*, Jan 23 p 303

Wood, W. A.:
Copper Rod Rolling Capacity*, Apr 24 p 1221

Woodbridge, Dwight E.:
Mechanization Pace Aggravates Employment Problem, June 26 p 1916

Woodin, W. H.:
President American Railway Car Institute, Jan 30 p 385

Woodward, C. H.:
New Uses for Steel, Jan 2 p 74

Woolson, L. M.:
Packard Diesel Engine, May 1 p 1336

World Engineering Congress:
Proceedings*, Jan 16 p 223; Jan 23 p 298

World's Fair:
(See Chicago World's Fair)

Wrought Iron Co. of America:
Mechanical Puddling*, June 19 p 1814

X

X-Ray:
Airship Proved Sound by, Apr 3 p 1007
Examination of Large Steel Castings*, Feb 13 p 499

(X-Ray, *Continued*)
Inspection of Welds by*, May 15 p 1466
Prevents Foundry Losses*, May 1 p 1290; May 15 p 1466
Studies of Die Castings*, Apr 17 p 1135

Y

Young, Clarence M.:
Aviation in Readjustment Era, Jan 2 p 22

Youngstown Sheet & Tube Co.:
Annual Report, Mar 20 p 875
C. S. Eaton, Director, Apr 24 p 1264
Indiana Harbor Merchant Bar Mills*, Feb 27 p 640
Merger with Bethlehem Steel Corporation*, Mar 20 pp 876, 987; (Editorial), p 882; Mar 27 p 948; Apr 3 p 1023; Ratified, Apr 17 p 1165; Suit to Block, May 1 p 1333; May 8 p 1429
Postpones Building Continuous Sheet Mill, June 26 p 1933
To Install Electric Welded Pipe Unit, June 19 p 1834

Youngstown Welding Co.:
Battle-Deck Mill Roof*, Feb 20 p 582

Z

Zeh & Hahnemann Co.:
No. 25 Percussion Power Press*, June 12 p 1763

Zimmerman Steel Co.:
Budget Control, May 22 p 1538

Zinc:
Production, 1929, Feb 6 p 486; June 19 p 1868

Zuege, David:
Status of Alloy Steel Castings*, May 1 p 1294

LIBRARY
WEST VIRGINIA UNIVERSITY